GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS

FROM DR. C. C. MILLER.

23° BELOW ZERO, Feb. 5—the lowest point up to that date.

THE BEGINNING of the series of articles on extracted honey, by Chas. Dadant, in *A. B. J.*, is something in the line of an historical treat.

THE BRITISH BEE JOURNAL thinks it is not an extravagant estimate to suppose the British Isles could produce annually 5250 lbs. of honey.

AN APIARY of 34 colonies on top of a four-story building in Philadelphia is reported in *A. B. J.* Averaged 50 lbs. per colony in 1892 and 1893.

"DOES IT PAY for the trouble to pack bees in the spring after taking out of the cellar?" is a query in *A. B. J.* Sixteen say no, five say yes, and a few give mixed answers.

THE A. I. ROOT CO. seems to be putting branch houses everywhere. Please give the street and number of the Marengo branch, so I can save freight from Medina.

AT ROCKFORD, ILL., convention, several cases of killing bees by spraying fruit-bloom were reported. One man sprayed his plum-trees while in bloom, and killed 30 colonies of bees.

I THOUGHT Doolittle was a Prohibitionist. But from the way he scatters around sawdust at intervals on the bottom of his bee-cellar, it's evident that he's quite familiar with the ways of the saloon!

"FOUL BROOD" and "compulsory powers" are words seen very frequently in connection in the *British Bee Journal* nowadays, which means they're making strong efforts to have foul-brood laws.

"I FIND NO DIFFICULTY," says J. Martin, in *B. B. J.*, "in retailing over half a ton of extracted honey every season at one shilling per 1-lb. bottle." Think of it! $250.00 for 1000 lbs. of extracted honey, and the bottles to hold it!

W. STOKES, Balnastraid, Scotland, writes: "I am very successful in wintering. I use an outer case, giving about two inches between it and the hive. This space I pack with mats made of rye straw, which gives warmth and ventilation."

G. K. HUBBARD reports in *A. B. J.* that in moving his bees by wagon 50 miles he laid "a small, tightly rolled roll of burlap across each end of the frames before nailing fast the covers." That kept the frames in place without other fastening.

IT'S DOUBTFUL if any one *overlooks* that ad. on p. 112. It won't hurt that chap to "look over" providing he moves cautiously; but a sudden dodge backward might be fatal, for the size of his lip is altogether out of proportion to the allowance of neck.

A NEW DEPARTURE in the way of programs is that of Wisconsin for their winter convention. Not a speaker or essayist is mentioned, but eight thoroughly practical topics are named for discussion, with no hours named. I bet you they'll have a good time.

HERR REEPEN, the *Centralblatt* epitomist, met a box-hive man with 450 lbs. of wax on his wagon who had harvested 6000 lbs. of honey, making him a net income of $625. Herr Reepen agrees with many others that box hives should still hold a place in the heather regions.

I DON'T KNOW who wrote this beautiful verse, but it's what I wish for all the GLEANINGS family:

Not to be tuneless in old age,
Oh! surely blest his pilgrimage,
Who in his winter's snow
Still sings with note as sweet and clear
As in the morning of the year
When the first violets blow.

WHERE ARE WE AT? GLEANINGS, page 104, talks of voting for men, "irrespective of party." What will become of our country if it comes to that pass that a man isn't ready to sacrifice any thing and every thing for "the good of the party"? Allee samee, I indorse what is said about our Eugene, and add that he's no office Secor.

HERE'S HOW Jas. Poindexter treats colonies that have swarmed, the same having clipped

queens: "The queen is caged and placed under the alighting-board, when the swarm soon returns, and at the end of seven days she is released in the hive. Usually this stops any further swarming during the season by colonies thus treated."—*A. B. J.*

The very same. *First Small Boy.*—We had a little baby come from heaven to our house last night.

Second Small Boy.—Huh! that's nothin'; we had one went to heaven from our house last night.

First Small Boy.—Say, Pete, I'll bet it's the same kid.

An American mixture that's sure cure for foul brood is mentioned in *B. B. J.*, and that skeptical journal expresses doubts about it, and says something about "wooden nutmegs." Now look here, Mr. J. Bull; we own up to the wooden nutmegs, but we don't want the humbugs of all creation saddled on us; and when one is gotten up on British soil, please don't put our label on it.

What a bit of spite can be shown by emphasis on some little word! When Mary marries John, Sarah (who has failed to catch him) says, "I *hope* Mary will be happy with him," and the special emphasis on that word "hope" predicts dire calamity for Mary. And now "ye editor" says, p. 104, "I *hope* the doctor's past record will enable him to live down such a report." Why couldn't he hush it up, as I do his failings?

That's a nice scheme of A. I. Root, to have a gain of a year by cutting crimson clover in time to plant corn on the ground; but, pray, where are the poor bees to have a chance then? Per contra, C. E. Thorne reports from Ohio Experiment Station in *Stockman:* "We have not yet succeeded in getting a satisfactory stand of this clover at the Experiment Station, though several attempts have been made, nor have we heard of its being successfully grown in this latitude.

HIVES, LARGE VS. SMALL.

SMALL HIVES MORE PROFITABLE, AND WHY; A CAREFUL REVIEW OF THE WHOLE MATTER.

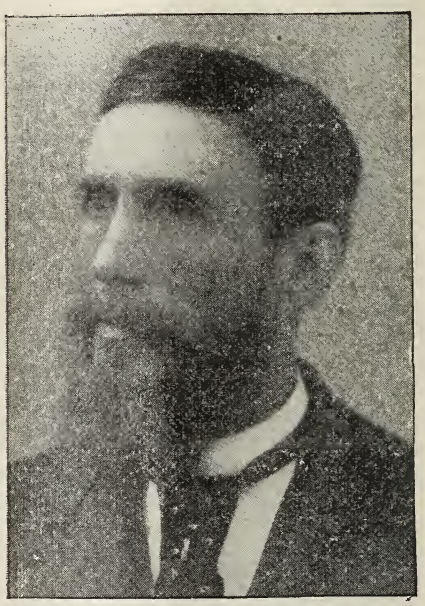
By H. R. Boardman.

I have been discussing the matter in my own mind for some time as to whether any thing more could be profitably said upon this already thoroughly canvassed subject. I am quite sure, when the arguments are all in, could the vote be taken, no change would be noted in the use of hives.

It could not be possible that all of the bee-keepers in this great diversified land, from the cold North to the sunny South, could agree upon the same kind of hive, either in size or style.

Methods must be as various as the climate. This question of hives, then, is largely a matter of locality. I can speak for my own locality only, as to what hives or methods suit me best. I would not presume to discuss with the bee-keeper of the South or West as to what is best for his locality.

Much depends, too, upon what is sought to be accomplished—whether the apiarist is working for comb or extracted honey, or both together; whether he wants increase, or wants to prevent increase; whether he wants to secure all possible of the honey gathered, and supply its place by feeding, or depend entirely upon natural sources. It seems to me that, for the production of extracted honey, the tiering-up feature would be indispensable, whether the hive used were large or small; and it also appears to me, that a small hive is better adapted to this purpose than a large one. But I am a specialist in comb honey, and perhaps had better consider the question from that standpoint alone. In order that my prejudices as well as my preferences be more clearly understood I will describe my hive:



H. R. BOARDMAN.

It is an eight-frame hive, taking a frame 12¾ x12¾ in., inside measure. You will see that this enables me to use a wide frame for sections that holds 9 sections, 6 frames to the hive, or 54 sections in a hive. I have recently, within two

or three years, commenced using 9 frames in my eight-frame hive, in a space of 12 in., and the number so used is increasing each year. It gives some advantages that I will not describe here, only to say it gives very nice combs; so you may put me on record as favoring the eight-frame hive with 9 frames in it, and with the tiering-up feature. Let me say, first and last and all of the time, that, in an experience of 25 years, I have found my hive large enough for every time and place.

There are two principal points which I take into consideration in deciding the proper size for a hive: I want it large enough to hold sufficient winter stores, and also to furnish about the right capacity for brood for the average queen—average, I say, for I have never been able to have all of my colonies breed up uniformly. Some queens will outdo and go ahead of the rest, while others will fall behind. It is a prominent feature of my work in the bee-yard during the early part of the season, when the bees are building up rapidly, to equalize the strong and weak colonies; and until I have all of uniform strength in the yard, and all built up to the full capacity of the hive. I think I have no need of more room; and with all in this condition I feel that I am well prepared for the beginning of the honey-harvest. I do, however, build up extra strong colonies sometimes by tiering up, which I will describe hereafter.

For winter stores I would consider it poor economy to have a hive larger than required, when well filled, to carry the bees through, and have the honey all cleaned out at the beginning of the honey-harvest. I should rather feed a little to bridge over than to furnish hive room, and tug in and out of winter quarters a lot of old stores that are worse than useless in the hive.

In the early days of my bee-keeping experience I used to buy bees in old box hives, and transfer them to movable-frame hives. These hives were of all shapes and sizes, and my work upon them gave me an excellent opportunity of observation, and I availed myself of this opportunity. Proper size of hives was one of the things I had in mind, and I satisfied myself that a brood-chamber of about 2000 cubic inches was near right; and the experience of many years since has confirmed that decision. In many of the largest of the box hives that I transferred, I found old stores that had been carried over from year to year until it was thick and waxy. I could not see how the colony could be benefited by this surplus of stores; and unless a knowledge of the reserve gave them a sense of security, I decided that such hives were too large. When hives were so small that brood-rearing had to be economized, I decided that these were too small.

LARGE SWARMS FROM BIG HIVES.

There has been a great deal said from time to time about large hives giving large swarms—big booming swarms—and much heavy argument is brought forward to show the profit of these large swarms, and consequently the advantage of large hives. Now, isn't it a fact that the size of the swarm depends almost entirely upon the queen. Would any queen produce any larger swarm in a large hive than a small one, so long as she was not restricted in laying and the bees were furnished room? I think it is the laying capacity of the queen that regulates the size of swarms almost entirely.

Now about the economy of large swarms. How large would it be economy to have swarms? Of course, there is a limit beyond which it would not pay to go. A large swarm costs just as much per pound to raise as a small one; and who can tell what is a big booming swarm—how many pounds of bees? So far as I can remember, no one has thought to tell us just how many pounds of bees there are in a big booming swarm that issues from a big hive.

If we had a big pile of bees, as we sometimes do in the swarming season, when several swarms go together, how many would it be profitable to put together in a hive in dividing them up? I have sometimes hived these big abnormal colonies all in one hive, and given them room, and watched them with expectation of wonderful results. To be sure, they work very rapidly at first, and do more than an ordinary colony; but they never come up to my expectation. They soon become normal in size, and never make a record that will compare with the same amount of bees in two colonies.

During the swarming season last year my bees were in what I called very fair strength. In order to know just what my swarms were, I set them on the scales and weighed them before shaking them out of the basket. I found them to weigh 7 to 7½ lbs., from single eight-frame hives. I could never see much gained by having swarms much larger than this.

BUILDING UP COLONIES BY TIERING UP.

I find no difficulty in getting brood reared in two hives by tiering up. In fact, I had thought that more brood could be secured by this method than any other I had ever tried. It involves some extra labor, and requires plenty of stores, unless honey is coming in. When a colony becomes strong, and needs more room, if a hive of empty combs be placed on top or over it, the bees will soon occupy it, and the queen will not be long in following. The empty combs, with a strong force of workers, make the conditions favorable for the queen to do her best, and she will not be long in filling the combs with brood. I do not expect the queen to continue laying in both hives at the same time. I do expect, and am not often disappointed, when the queen goes above, that she will continue work in the upper hive until it is full of brood; and unless honey is coming in, the bees will remove a considerable portion of the honey above also, thus leav-

ing the lower set of combs empty, or nearly so, as fast as the brood hatches. My hive being deep, no doubt gives different results from a shallow one. Bees are inclined to occupy the upper hive when tiered up. This I call forcing the queen. I can, if I wish to continue brood-rearing longer in both hives, set the bottom hive on top, and it is in the most favorable condition to tempt the queen above again. But it is not economy to push brood-rearing far into the honey season.

The tiering feature I find valuable in uniting colonies. I just place one colony over the other, with a honey-cloth or oil-cloth between, with a corner turned so that a small passageway enables them to get acquainted, and, after a few days, remove the cloth, place the hive to be occupied on top, with the queen.

In the same way I unite colonies when they are set out of winter quarters; but no cloth is necessary between the hives, nor is it necessary to kill one of the queens. Being of the same scent, they unite without confusion; and often both queens continue work for some time. There has been much of the best thought of our best apiarists expended in devising methods by which brood-rearing could be judiciously encouraged early in the season, when the colonies are light, and are struggling against vicissitudes of weather, with a large amount of brood to care for. Contract the brood-nest by use of division-boards and dummies, the use of cushions, and packing and care resorted to for the purpose of protecting the colony and economizing the heat. But these are all expensive, and involve much labor and continual fussing, and I think they are only arguments in favor of smaller as well as more properly constructed hives.

I have not called attention to the advantage of a small hive over a large one, in the lifting, carrying in and out of winter quarters, etc. The ground has all been gone over, but this I consider an important item not to be overlooked.

After all, the question is not whether A can get better results with a large hive than with a small one, but whether A can get better results with a large hive than B can with a small one under the same conditions.

East Townsend, Ohio.

[For a long time I have been more and more convinced, from various talks that I have had with Mr. Boardman, that he is one of the keenest, brightest, and most intelligent bee-keepers we have; and if there is a closer observer of Nature and her laws I do not know him. I have been trying to get him to write; but it was not until now that I have prevailed upon him to give us a series of articles, and the one above is the first installment. The subject he has taken up and handled so well is one that I assigned to him, as I believed him to be as competent as any one to review the whole situation, now that it is about time to draw the hive discussion, both large and small, to an end for the present. Mr. Boardman's articles will probably be somewhat of the nature of a review of the literature that has appeared in the past in GLEANINGS.

I had expected in the present article that he would be somewhat on the "other side of the fence" in this hive discussion; but although he uses a different size of frame, it is somewhat encouraging to see that, with Doolittle and a host of others, and over a different route, he has settled upon 2000 cubic inches as the correct size of brood-nest. Mr. Boardman says he finds no difficulty in getting brood reared in two hives by tiering up. This is the position that some of us, in opposition to that practical bee-keeper, C. A. Hatch, have held, and I am glad to see one more good authority to sustain us in this.—ED.]

A very interesting and valuable article quite in line with Boardman's views will be found in this issue, by G. M. Doolittle, on page 137.

BEE-KEEPING AS A SPECIALTY, NOT A SUCCESS.

FRUIT-GROWING AND BEE-KEEPING A GOOD COMBINATION IN CALIFORNIA.

By Wm. G. Hewes.

Essays advising that bee-keeping as a business be made a specialty by the persons engaged therein have been written from time to time. The essayists are often eloquent in their advice, but never, I believe, practice what they preach. One of the best of these articles was written by a gentleman in Michigan whom Ernest Root, in his recent bicycle-tour, discovered to have a very fine orchard. The "G. in M." has, no doubt, perceived, as has the writer, that the growing of fruit fits in more happily with the production of honey than does any other occupation.

The bees in this part of California require constant attention during the months of April, May, and June. During the remainder of the year, a few days' attention each month is all that is needed. Now, during the months of April. May, and June, when the bees need constant attention, the requirements of an orchard are only cultivation, and this simple work can safely be entrusted to any ordinary farm help. The specialist bee-keeper, by the first of July, is beginning to wonder how he is going to "kill time" for the next nine months (and if it be a dry season following, he will have to kill time for the next twenty-one months); but the fruit-growing bee-keeper quits his extracting to attend to the drying of his apricots; and from apricots he goes to peaches, to prunes, to pears, to grapes, to figs, to apples, almonds, olives, or oranges, as the soil or climatic conditions of his locality make most profitable. By a proper selection of varieties the fruit-growing bee-keeper can harvest fruit from the end of his honey harvest until the beginning of the winter rains, at which time he has leisure to plow his orchards and paint his hives, thus occupying the whole year in a way conducive both to his happiness and his profit.

Numerous have been the devices of bee-keep-

ers to "kill time" during the eighteen months which have elapsed since we last had honey to extract. Some have got a "job" on fruit-ranches, others roam the hills with guns, potting quail and rabbits for market; and others again have retired to the mountain fastnesses with pick and shovel, to delve in the gravel of the creek-beds for gold dust; but their realizations are generally smaller than their anticipations. Only once have I heard where, in this seeking after gold, the realizations equaled the anticipation. But this bee-keeper did not dig his gold, for he was a bold bad bandit and wrecked a train. The sacks which he carried away are said to have contained $20,000. In course of time he was captured, and now he will never "herd" bees again, for both himself and his partner (a nice young man from the Salvation Army) are living in strict retirement.

I wish here to place myself on record as saying that the making of bee-keeping in California a specialty is the acme of asininity. Many bee-keepers owning plenty of land do not even grow fruit enough for home consumption, believing it can not be grown excepting on those lands which can be irrigated. If they will plow deep, and then with harrows and clod-crusher pulverize the soil to the fineness of meal, and by constant cultivation keep it so, they can grow any thing. I care not how deep down it is to water. I have planted grape-cuttings, and gathered a bunch of grapes from them the same season. From apricots and peaches I have gathered fruit eighteen months after planting the tree; and almonds, pears, and prunes will give fruit in from three to four years after planting.

Newhall, Cal., Jan. 20.

[If I understand you correctly you are not a firm believer in bee-keeping as a specialty; and you point to the gentleman in Michigan, who has been an advocate of this doctrine, and say in effect he is not a practicer of what he preaches. Mr. Taylor—and I presume this is the chap to whom you refer—makes a success in both lines, and very possibly he would of bee-keeping alone in good seasons; and, moreover, I understand he is a good lawyer; and that being the case he may and probably does get some revenue out of that profession. But during the past few poor honey years in Michigan, when many of its bee-keepers were glad to average even 10 lbs. per colony, Mr. Taylor would not have found bee-keeping a good bread-and-butter specialty. One of the hardest blows to the idea of bees as the sole bread-winner has been the series of poor years. During the good old-fashioned years, and Mr. T. probably had reference to these, such as we *used* to have, when bees every year brought to their owner some returns, the specialty business was a success. But now I believe I can almost count on the fingers of my hands the number of men who derive their living largely from bees; and if I except from that number those who have absolutely no other source of revenue there is scarcely one. But take it in other branches of agriculture, those who make a specialty of any one line are very few. Even our friend T. B. Terry, who has been a strong advocate of specialty on the farm, and one who used to grow potatoes exclusively, and buy his other products, I believe now makes quite a business of growing strawberries, and lecturing throughout the State.

Well, then, if we accept the idea that specialty in bee-keeping to-day is not common, what other lines of business combine with it nicely? The one already mentioned—fruit-growing—is one of the best. Poultry-raising is also connected with it; but as a general thing you will find that the great majority of our bee-keepers are practical farmers, and that their bees are only a side-issue.—Ed.]

OUR HONEY RESOURCES.

HOW TO INCREASE THEM; A VALUABLE ARTICLE REVIEWING THE ATTEMPTS THAT HAVE BEEN MADE IN THE PAST.

By C. H. Dibbern.

Ever since I commenced bee-keeping, some thirty years ago, it has been a constant study with me how to increase the yield of surplus honey. Many a time during my enthusiastic periods, when the flowers yielded abundantly, I have thought that, owing to some device I happened to be trying at the time, I had "struck it rich," and visions of future wealth and position in the bee-world would loom up in the dim distance, only to be dashed to earth when the poor years came again. Indeed, bee-keepers seem to be of such a hopeful disposition, that, during years of abundance, they quickly jump to the conclusion that the coming years will all "flow with milk and honey," and that the hard times, when the flowers are scarce, or will not "give down," are indeed past for ever. However much we may have indulged in such thoughts, the recent few years of poor yields, and failure, have dispelled the illusion.

My first efforts to overcome short yields was to "invent" a new hive that would enable the bees, by its peculiar shape and heat-economizing principles, to secure the honey whether the flowers yielded or not. This worked all right while the years remained propitious; but when poor honey seasons came again, I came to the reluctant conclusion that, after all, not so much depended on the hive as on some other things.

About this time comb foundation made its appearance, and I straightway made up my mind that this was the long-sought desideratum. Why! was it not perfectly plain that all we need to do was to give the bees frames and sections, filled with these waxen sheets, and, presto! combs of nice sealed honey. But this, too, the hope-destroying poor years soon laid low. It was soon understood that, though it was an excellent thing to secure nice straight comb when honey could be found, it was utterly useless when the flowers refused to yield.

About next it was the particular strain of bees that was to give us the great yields. The superior honey-gathering merits of Italians, Carniolans, Cyprian, *et al.*, were duly extolled. Some of our enterprising queen-breeders even

tried to improve on these well-known old-fashioned names by advertising "Golden Carniolans," "Punics," "Five-banded Italians," and "Red-clover" queens that "just rolled in the honey." Well, the "rolling" business struck most of us, who had met so many disappointments, very favorably, and many of us sent off our money-orders and received the coveted queens in due time. But again the poor seasons soon taught us that even the most industrious bees could not "make" honey.

Then it was thought that, by manipulation, the desired results might be secured. Then the non-swarming craze, the doubling-up plan, and non-swarming devices; making two swarms work in the same set of supers had its day; but, strange to say, not much is heard of them of late.

Now, I believe most bee-keepers who have been engaged in the pursuit for 15 or 20 years have had just about the experience here related, and I do not wish to be understood as running down these efforts to improve our calling. I fully believe that all these things have been of great advantage. The hive, foundation, the kinds of bees, the manipulation, are subjects that can not be overlooked by the person who may hope to be successful.

I think that most of us have learned that, really, there is no short cut to success in bee-keeping. The desire, however, to advance, and take advantage of every suggestion and improvement, if it really is an improvement, is a laudable one, and should be encouraged. It has long appeared to me that the most promising field to increase our surplus-honey yield was to increase our honey-yielding flora. It is, perhaps, well enough to hunt to "the ends of the earth" for better bees; but why not send practical bee-men to study the honey-plants of other countries, with a view to introducing them here? It must be that some of the plants that yield so abundantly in other countries would do equally well here. Our linden is rapidly disappearing; and the white clover, owing to our scorching summers and snowless winters, is almost a thing of the past. It is becoming quite evident that something must take their places, if we may expect honey-yields in the future.

Some fifteen years ago I commenced sowing honey-plants in waste places, about stone-quarries, along creeks and rivers, wherever a suitable place offered, and where no objection would be likely to be raised. I have tried about all the honey-plants that have attracted attention, including Simpson, Dr. Tinker's golden, Chapman's, Rocky Mountain, etc., and I now find some of these plants growing in the most unexpected places. The plant, however, that has given decidedly the best results, and one that is able to hold its own against all the world, is sweet clover. It is a "dandy," as Mr. Muth says, and, no matter what the season or the weather, it can be depended on to furnish a fine quality of honey.

Some years ago I rented from three to five acres of land adjoining my apiary, and kept it in sweet clover for a number of years. While so small a field did not give a yield of surplus honey to 150 to 250 colonies of bees during poor seasons, yet it kept up brood-rearing, and often gave me some surplus from fall flowers that I should not have secured otherwise. Strange as it may seem, the sweet clover has now spread for several miles, growing wherever it can gain a foothold; and in a few years more it will, no doubt, be the main honey-plant in my locality. I am glad to see such men as M. M. Baldridge write about sowing 80 acres to this plant, and shall anxiously watch the result. I see no reason why Mr. B. could not make it a paying crop for seed alone; and 80 acres of sweet-clover bloom, in the immediate vicinity of an extensive apiary, is a factor not to be despised. I have often wondered why farmers did not make more use of sweet clover as a forage plant and for fertilizing. I know of several hog-lots, of from 10 to 20 acres, that have produced nothing but dog-fennel for the past ten or fifteen years. Why not plow up, say, half, plant to sweet clover, and keep the hogs off for the first year? The next spring, plow and seed the other half and turn the hogs in to live on the tender clover-shoots. If not overstocked, enough clover would bloom and seed the ground to keep it from running out. Incidentally the neighboring bee-keepers would be benefited. Who will try my plan?

Of course, it is always a good plan to do what we can to induce farmers to sow alsike clover, buckwheat, and other honey-producing plants. One trouble with this idea is, that usually, when clover, alfalfa, etc., begins to bloom, the farmer appears with his mower and cuts it down. But it often happens that, if you can convince the farmer that the seed of the alsike, alfalfa, etc., will pay well, he may be induced to let it stand till done blooming, and thus give the bee-keeper the full benefit of the bloom.

Milan, Ill.

[As. Mr. D. says, there is no short cut to success in bee-keeping. But there are a great many conveniences or "little comforts," as some have called them. A good point is made in utilizing the waste weed-patches. Sweet clover is a sort of weed; but if nothing but weeds will grow in these places, put one there that will be worth something. Dr. Miller is a firm believer in this doctrine; yes, he practices what he preaches; but don't tell him that *I* said so.—ED.]

HONEY-PACKAGES FOR EXTRACTED HONEY.

WHY HONEY-BARRELS LEAK SOMETIMES; THE REMEDY; ANOTHER VALUABLE ARTICLE.

By E. France.

In GLEANINGS for 1894, page 633, the editor makes a plea for tin cans. I think cans are all

right for small lots. I would a great deal rather handle a large crop in barrels. I have tried tin cans, and do use some yet for small shipments. For large lots barrels are cheaper, ship for less freight, in less carload lots. I don't know how it would be in car lots. When extracting in our out-apiaries we can with less trouble put the honey in barrels, and load them easier, than we could cans. With a pair of skids three or four boys will roll into a wagon a few barrels very quickly, whereas cans would have to be lifted in two at a time—heavy work; and when the cans are used, and the honey gets candied, they are a miserable thing to get the honey out of. First the cans must be filled full to hold 60 lbs. Now, it must be melted to get the honey out; and unless you are especially fixed for the work it is no fool of a job. I have set a can in a wash-boiler; have set them in the water-reservoir back of the stove, and it takes a long time to melt, as the honey is in one solid chunk. The screw-cap must be taken off; then, ten chances to one, the honey will swell up and run out of the top before it is melted, making a loss and a muss; and a 60-lb. can is a pretty heavy thing to lift up high enough to put into a boiler on the stove. First-class oak, iron-bound barrels cost me, made here, $1.50 each, holding 370 lbs., warranted not to leak. I have handled our honey in such barrels for several years, and they do not leak.

As for melting the honey in the barrels, I don't do it. I take the hoops all off at one end of the barrel, then the head will come out. Take out the head, drive on the hoops again. Now dig the honey out of the barrels, and melt it in a tin pail; set in a kettle of water over the fire, or melt it in whatever you please; but have your melting-dish set in water to prevent scorchingthe honey. I can pack honey in barrels, and sell it for half a cent a pound less than if packed in 60-lb. tin cans; and then the shipping freight is a good deal less.

But there is a growing demand for 60 lb. cans. I suppose that is for the reason that such kegs as molasses is packed in are not suitable for honey-packages. They are too frail, and leak. A good oak keg, made suitable to hold honey, costs too much. When I first began to extract honey I had very much trouble to get a good package. I went to the best cooper in town, and bought some kegs that held 140 lbs. of honey—oak, with iron hoops. Being a cooper myself, I thought they were all right. He brought them out of the cellar. I took them home and filled them—14 of them; also got one barrel that held 500 lbs. I had them in a room above ground. In a few days they began to leak, and made me a great deal of trouble. That year my home market took all the crop at retail, so I had all the kegs left over to fill again the next year. I made up my mind that honey kegs and barrels should be kept in a dry place; then, as fast as I get one empty, I put it upstairs in the shop, first washing the keg out clean inside, and putting in the head. I let them stay there and dry out until I wanted them the next year. I got some new barrels made and put them up stairs also. Result—when I wanted them the next year they were dried out. I drove the hoops, and they were tight. I filled them with honey, and there was no leaking. We have never been troubled with leaky barrels since. We now have our barrels made in the winter. We put them in a dry warm place until wanted; and if they are well made they won't leak. It won't do to keep honey-barrels down cellar. Barrels will soon leak when taken from the cellar and filled with honey. Honey doesn't seem to keep barrels from drying out. Leaky barrels filled with water will soon swell and hold water; but not so with honey. It won't do to pick up any thing you may find down town, for honey-packages. They will be sure to leak, as they are kept in a cellar. I think the honey will pay for a good package, clean and tight.

After we had found out how to fix barrels so they would not leak, we found we could save a little money by buying barrels that would hold 530 lbs. in place of the ones we were using, that held 370. The small ones cost $1.50, the large ones $1.60, so we got 50 of the large ones. We found the large ones unhandy. They are too big. A 370-lb. barrel is about right, we think. For retail trade we use tin pails. One and two quart sizes take the best in Platteville.

Platteville, Wis.

[Many of the difficulties between the bee-keeper and the buyer of honey is over leaky barrels. The one says that so much honey was lost, and the other doubts his statement, and so on the trouble goes. All of this may be avoided by reading carefully what Mr. France has to say above. The trouble in many of the cases is not so much with the commission merchant or buyer as with the producer, or, rather, his (the producer's) lack of knowledge. Although the Dadants the Muths and ourselves have repeatedly said that barrels should be kept in dry places, and that they should *not be soaked* with water before putting in honey to make them tight, yet almost every year there are a lot of bee-keepers who go on and do this same thing, and as a result reap the natural consequence—loss of honey, and a distrust of the buyer. I think it would pay every bee-keeper who ships his honey in barrels or kegs to paste this up in his honey-house, where he can read it once in a while.

The editorial referred to was by our business manager, who has had some of the troubles above mentioned, and his solution of the difficulty seemed to be in the use of tin cans. When I visited Mr. France last summer I saw stacks of barrels of honey that were perfectly tight, not even showing the least trace of leakage. These same barrels, as Mr. France explains, were bought some time ahead, and kept in a dry place, and allowed to shrink all they would; then after being carefully coopered up they were ready for the honey.

Regarding the square cans and barrels, it seems to be largely a question of locality. In California and certain parts of the West, on account of the dry climate, square cans are used as

a matter of necessity. In the New York markets, and in Albany, I found that barrels and kegs were preferred by all the commission men and buyers. Two square cans in a box, they claimed, were heavy and unwieldy; and then if they were dropped, a bad leak was the result. One commission man, I remember, told me he would not have a square can of honey in his place if he could help it; that there was no reason for kegs and barrels leaking if the producer only understood his business, and that, in his opinion, it would not take them very long to learn after they had shipped honey once or twice, and had about half of it lost by leakage.

I suppose much of the trouble from leaky barrels is owing to the fact that second-hand molasses-barrels, none too good in the first place, were used. The Frances, you see, buy new barrels and make sure that they get good ones at that.

This article will be seasonable, inasmuch as it is the proper time now to procure your barrels for next year. They should be put up in a dry room, where they can season thoroughly.—Ed.]

CALIFORNIA ECHOES.

By Rambler.

Great Scott! I have just learned that there are 191,988 bachelors in California.

It is a real pleasure to receive the first numbers of the bee-journals for the new year. All show a progressive spirit, which is a sure indication that the industry is marching on. Glory hallelujah!

Hum! pull the cobwebs outen your ears, and listen. The word bee-paradise is floating in the air. Mr. Blankton, of Beeville, Tex., in *A. B. J.*, says, "This is, no doubt, the bee-paradise of this continent."

Some time ago Dr. Miller wondered or speculated why the queen-bee has a curved sting. Did you ever see a queen-bee sting a rival in her cell? She clings around the cell; and the sting, following the curve of the body, strikes the rival in the thorax. Of course, the sting has to be curved to "get there."

That was real mean for Mr. Thilman to say that our beautiful white-sage honey tasted of alkali. Why, bless you, sir, our sages do not grow in the alkali lands. We have but little alkali lands here anyway; and where there is much alkali the ground is barren. No, sir; you will have to taste again; then taste of that basswood honey, and see how minty it tastes.

In *A. B. J.*, Bee-master says: "A narrow belt of the Dominion of Canada, extending from the Atlantic to the Pacific, has no superior as a honey field anywhere in the wide, wide world." Gallup says, "So California is not only the bee-keeper's but the old man's paradise"—enough paradise for two. Paradise is also found in Florida, Cuba, heavenly Topolobampo, and Australia. So paradise seems to depend upon how much the love of one's locality is diffused over the cerebrum. It is clearly a brain trouble. Dr. Peiro, what shall we do with these fellows?

I note that Dr. Miller is troubled about stopping cracks in boxes. Beeswax, if run into corners of boxes, is sure to scale and crack. Try paraffine. It is free from the habit of cracking, and sticks well. Quite a loose-jointed box can be made water-tight by fitting into it a piece of canton flannel; but before fastening it in, saturate it thoroughly with hot paraffine, then secure with small tacks, and your box is water-tight. That is the way I make cheap trays for photographic work.

There, now, those Canadians are trying to get ahead of me on that magic-lantern business. I had that very idea maturing and experimenting on slides, when they popped up with their lantern plans. Well, this is a big country, and I think there is room for several operators of the slide; and there is a splendid opportunity in this direction for the proper education of the public in relation to bee-keeping, methods of work in the apiary, the opening flowers, and a hundred interesting things. I wonder if we can not get up a bee photographic magic-lantern exchange club. What do you say, friends, in Canada?

I notice, Mr. Editor, that your proof-reader, or some one else, in seeking to correct my pronunciation of Spanish names, is making some mistakes that will, of course, fall upon my head. The Spanish as spoken here is not the pure Castilian. It is corrupted more or less; and when I give the pronunciation after a word I give it just as I have heard it spoken scores of times. For instance, in Ramble 123 I used the name *Jolon*, a town. It is pronounced *Holoné*, and your interpreter put it *Jo*—, which is wrong, as he of course knows, for all Spanish words having a J in them are pronounced as an H; as, San José (Hosay), or San Joaquin (Hoaquien), or, as it is popularly pronounced, here, Wauk-een. Then in the same ramble Gonsales is fixed over into goan-*saw*-lais. Now, that is near the *Castilian* pronunciation, but here it is cut short, and is pronounced as gun, or gn-saw-lis. I mention these words, and especially "Jolon," for California readers will notice the wrong rendering, and accuse me of being a tenderfoot.

[Regarding the Spanish words, it was a typographical error that we did not represent Jolon as if pronounced Ho-*lone*, as a Spanish J is a Yankee H; but Rambler makes three syllables of it, as if pronounced Ho-lo-*nay*. In this regard we fear he stands "H'lone." We believe that even those who speak Spanish with a brogue would regard the figured pronunciation of the other words as correct, from the standard of the Spanish Academy. The trouble was, if any, the pronunciation was *too* exact. We have always tried, and shall continue to do so, to give Rambler's exact meaning; and in the case in question we are glad we got it too good rather than too bad. So far we have followed Rambler very closely in his travels, by means of a map, lexicon, and Spanish books, and have tried to verify every word printed.—Proof-reader.]

WEED-SEEDS SOMETIMES FOUND IN CLOVER SEED.

AN IMPORTANT WORK BY THE NORTH CAROLINA EXPERIMENT STATION.

Bee-keepers have more or less to do with all the clovers; and as there has been in times past quite a little trouble in regard to various seeds, and some discussion as to what these seeds were, we have thought best to extract the following from Bulletin No. 108, of the North Carolina Experiment Station, which station has kindly loaned us the cuts given:

THE CLOVER FAMILY.

The clovers are the most frequently adulterated, and generally the foulest samples found in the markets. Crushed quartz rock, either plain or colored, to resemble true seed, has been frequently employed where dealers do not fear detection. Old, discolored, and worthless seeds are often dyed, and mixed

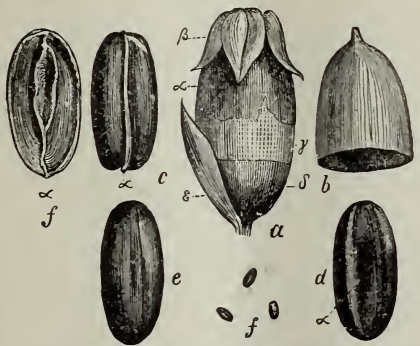


FIG. 18.—PLANTAIN.—a, fruit, with attached corolla; b, the 4 corolla-petals; c, twin seeds; d, the inner surface of seeds; e, back of seed; f, seed, natural size.

with fresh seed. These "doctored" seeds can be detected by pouring some of the seed upon a clean white cloth, slightly moistened, and rubbing the seeds thereon. The cloth will remove the artificial coloring, and show it. Quartz grains can be readily detected by examining the seeds with a magnifying-glass. "Uncleaned" samples often contain a fifth of their weight in weed-seeds, the most common of which are plantain (*Plantago lanceolata*, Fig. 18),

FIG. 19.—SHEEP SORREL.—a, seed in hull; b, a naked seed; c, natural size.

FIG. 20.—CHICKWEED.—a, natural size; b, magnified; c, same in profile.

sheep sorrel (*Rumex acetocella*, Fig. 19), chickweed (*Cerastium triviale*, Fig. 20), pigeon-grass (*Setaria glauca* and *S. viridis*, Figs. 21 and 22), ox-eye daisy, dog-fennel, and buttercup. Seeds of a parasitic plant commonly known as dodder, "devil's-gut," and goldthread, are usually present in samples of lucerne and clover imported from Europe. These plants, botanically called *Cuscuta epilinum* and *Cuscuta trifolii*, are shown at Figs. 23 and 24. Samples which contain even a trace of seeds of this foul parasite should be rejected, whatever be their price. A full account of this weed was given in Bulletin 70 of the North Carolina Experiment Station.

FIG. 21.—PIGEON-GRASS (GREEN).—a, b, back and front views, enlarged; c, natural size.

FIG. 22.—PIGEON-GRASS (YELLOW).—a, magnified to show marking; b, natural size.

Alsike-clover seed (Fig 25) is largely imported from Europe, and is apt to contain dodder-seed (Fig. 24—on the ground), which, being of nearly the same size as the clover-seed, is very difficult to get rid of. Uncleaned samples are more or less infested with seeds of buttercup, plantain (Fig. 18), sheep sorrel (Fig. 19), and chickweed (Fig. 20).

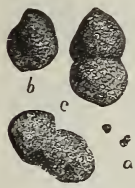


FIG. 23.—FLAX DODDER.—a, natural size; b, magnified; c, double seeds.

FIG. 24.—CLOVER DODDER.—r, section of a seed; c, endosperm; v, vegetation point.

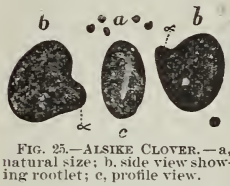


FIG. 25.—ALSIKE CLOVER.—a, natural size; b, side view showing rootlet; c, profile view.

Crimson-clover seed is generally much cleaner than other clovers, and the samples are not often adulterated. The most common impurities are plantain (Fig. 18), ox-eye daisy, and sheep sorrel (Fig. 19).

Japan clover is usually sold in the husk, and is not adulterated; neither does it contain as impurities other kinds of seed, for Japan clover permits no other plant to grow among it.

FIG. 26.—COMMON PIMPERNEL.—b, double fruit; c, d, single fruit, back and front view, enlarged.

Samples are, however, often very dirty with sticks, stones, and trash. In dry seasons the seeds do not fill well. Good seed should weigh 24 pounds to the bushel.

Lucerne seed is largely imported from Europe, and is apt to contain dodder (Figs. 23 and 24), plantain (Fig. 18), common pimpernel (*Pimpinella saxifraga*,

FIG. 27.—RAGWEED, hulled seed, with pappus; a, natural size.

FIG. 28.—RANSTED-WEED.—a, b, front and profile views; c, natural size.

Fig. 26), and seeds of composite weeds. American-grown seed-samples are apt to contain seeds of hog-weed (*Amarantus spinosus*), dog-fennel, and pigeon-

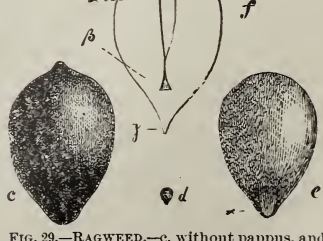


FIG. 29.—RAGWEED.—c, without pappus, and cut open; d, natural size; d, e, naked seed; f, section of seed, showing cotyledons.

grass (Figs. 21 and 22). European lucerne-seed is generally better than American-grown seed. The best comes from Provence, in France.

FIG. 30.—CORN COCKLE.—a. natural size; b, magnified.

FIG. 31.—WHITE CLOVER.—a, natural size; b, side views, showing rootlet; c, profile.

Red-clover seed is not now imported from Europe. The most common adulterants are quartz grains, which can be detected by using a magnifying-glass. Uncleaned red-clover seed is probably the foulest seed on the market. The most common impurities found are plantain (Fig. 18), sheep sorrel (Fig. 19), pigeon-grass (Figs. 21, 22), ragweed (*Ambrosia artemisæfolia* (Figs. 27, 29), ransted-weed (*Linaria vulgaris*, Fig. 28), corn cockle (*Agrostemma githago*, Fig. 30), dog-fennel, ox-eye daisy, and wild carrot. Dodder (Fig. 24) is also apt to be present in samples of red clover, though not so frequently as with lucerne. The least trace of dodder-seed should condemn the sample.

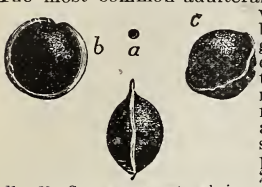


FIG. 32.—SPURRY.—a, natural size; b, c, d, different views, magnified.

White-clover seed—shown in Fig. 31—is, to some extent, imported from Europe, and it is sometimes adulterated with old and dead seed, colored and doctored with sulphur, to resemble fresh seed. Quartz grains, either plain or colored, are used for the same purpose. The most common impurities in badly cleaned samples are plantain (Fig. 18), sheep sorrel (Fig. 19), and spurry (*Spergula arvensis*, Fig. 32). Dodder may be present in samples of white clover, but it does not affect this species as much as it does red clover, alsike clover, and lucerne.

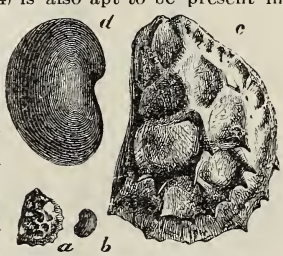


FIG. 33.—SAINFOIN.—a, c, the hulled seed; b, d, the naked seed; a and b, natural size.

THE SEALED-COVER QUESTION REVIEWED.

WHY THEY WERE CONDEMNED.

By A. S. Martin.

Friend Root:—I would ask those who make such a handle of bees wintering in cracked hives and rent hollows of trees if they ever took the trouble to observe the situation of the cluster. Were the bees really exposed to the draft from those crevices? Pshaw! nonsense! they can not be induced to form their cluster in the midst of an upward draft, if they can possibly avoid it. In all these cases it seems certain they were able somehow to shun it. Those reports in GLEANINGS, seemingly so adverse to sealed covers, appear to me exceedingly defective and unsatisfactory. They almost, without exception, ignore bottom ventilation. How can such reports give the "black eye" to sealed covers, or "seal their fate"? The trouble seems to have been with the sealed or partially sealed bottoms. The interior of a hive with close walls and sealed cover is practically a dead-air space, subject to no fluctuations but such as the bees themselves create, provided the hive is as it should be, sheltered from the wind. In such a hive, bees have perfect control of ventilation, as* Nature evidently designed they should have. They will ventilate perfectly such a space if they have free access to the external air. They do it in summer, and why not in winter? They are not then helpless hybernants, as some seem to suppose. They arouse at intervals and attend to their needs, and are never all asleep at the same time. You can hear them at all times.

Mr. Quinby's reversed hives had no upward ventilation. Mr. Taylor's results with lots 1 and 2 (see June 1st GLEANINGS, of 1893) prove nothing more than that such methods may be practiced with impunity in a temperature of 42°. In summer he can go still further—leave both tops and bottoms off, and his bees will not perish if he will only give them shade and shelter. But what shall I say of lot No. 3? The damp interior, the wet moldy combs, the dead bees, conjure up visions of the Black Hole, of Calcutta. Mr. Boardman and others use sealed covers and have no such results. Why? Because they provide *sufficient* bottom ventilation. Bees must have fresh air, and plenty of it; but how can you by upward ventilation adjust the supply to their needs? You can't do it, and needn't try—too much or too little. In either case your bees are injured, if not destroyed. The mere fact of their living till spring is no proof that they have not been injured. Discomfort, sleeplessness, the wear and tear of their efforts to keep warm, fit them admirably for the process of spring dwindling.

Bees do well under sealed covers in Virginia. I have kept them thus 45 years, and have never lost a colony in winter but by starvation or thieving. Perhaps Nature did not design them to live in more northerly climes, hence their propolizing instinct is there at fault. In order to do well they should there be endowed with a penchant for such abodes as disused chimneys and stovepipes, and, like bumble-bees, roof their nests with old rags, moss, and bits of stubble.

Dear brothers, I am not trying to ridicule any of you; but I can't help pointing a jeering finger at the long ears of this ridiculous thing called upward ventilation. If you will stick to upward ventilation, suppose you try the cracked-hive plan. Seal a cover over ⅝ or ¾ of the frames, or of their length, and then cover this and the remaining space with your absorbents, cushions, etc. May be this will prove a happy compromise. I use heavy cotton cloth, thoroughly saturated with melted bees-

*When a medical student I was taught to follow the indications of Nature. I have ever found this to be a safe rule. There are those who scorn it. But Nature appears to me a something sparkling all over, and radiant through and through with intelligence.

wax, sealing it to the tops of the frames and upper edge of the hive with a hot iron. On this waxed cloth I place six or eight folded newspapers, and over all an inch board with a brick on top to keep it in place; entrance, ¾x16 inches; hives on summer stands, sheltered from westerly winds.

Roanoke, Va., Nov. 27.

[Dr. Martin advocated the sealed cover back in '84. He was quite disappointed that they should have been so hastily condemned last spring.—Ed.]

RAMBLE 126.

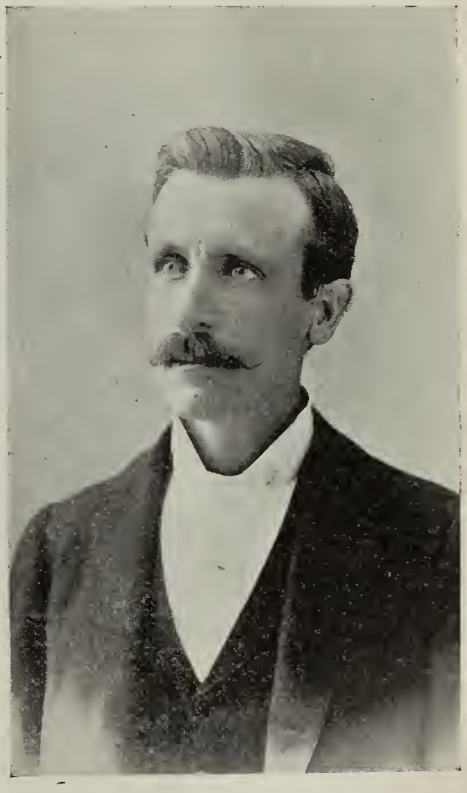
AT PRYAL'S AND THE STATE UNIVERSITY.

By Rambler.

The towns became more numerous, railroads ditto; telegraph and telephone poles with their burden of wires ditto; also vehicles on the road, all the way from a road-cart up to the many-teamed wagon, the elegant carriage with happy-looking smiling ladies; the equestrienne with bifurcated skirts, and some, more sensible, with skirts, and the appendages they cover, carried on a side-saddle, according to the old plan. All of the above and much more made us feel a little out of place, in our rough traveling-garb, for we were being drawn irresistibly by the throng to those great business-centers, San Francisco and Oakland.

It is always best to prepare for an emergency before we emerge into the emergency. We therefore camped early at the pretty little town of San Lorenzo, 12 miles from Oakland. We here razored our faces, shampooed our shoes, and made such changes in our wearing apparel as we thought would enable us to pass for a couple of well-to-do members of the rural community.

Our black shirts (not black from dirt, by any means, but dyed black early in their manufacture, and quite fashionable with people who travel in the dust) we exchanged for the white variety, with collars to match; and various other garments, which had been packed away for so many weeks, were donned; and in the morning, when we again started on our journey, it seemed to me that we had left two other fellows behind at San Lorenzo. In our better habiliments we drove direct into the center of the fine city of Oakland. We found Telegraph Avenue, and, following it out several miles, finally landed at North Temescal (which is really only a suburb of Oakland), and at the home of Wm. A. Pryal. Of course, you all know Mr. Pryal as a genial writer for the bee-journals. He is a bee-keeper and queen-breeder; and before going further I wish to introduce his visage to you through a half-tone; and, better yet, I wish to say right off, and say it loud—yes, I want to shout it—*he's a bachelor!* ha, ha, ha! Let's shake, Mr. Pryal—ha, ha! shake again; shake, Wilder. Well, aren't we three just as happy as three big sunflowers? After our sort of ebulition, and jubilee of fraternal feeling we camped upon a cozy corner of the Pryal property. Upon one side of us was the murmuring waters of the Temescal Creek, over us the tall gum-trees, whose leaves also murmured in the evening breeze that came fresh from kissing the waters of the grand Pacific Ocean. Fruits, flowers, and vines were growing in profusion all around the Pryal homestead, and in such variety as would bewilder the eyes of the novice, and doubly bewilder the nose with the various flower-scented perfumes.



W. A. PRYAL.

Mr. Pryal resides under the paternal roof, and the apiary nestles snugly under the fruit-trees near the house. The senior Pryal came from the Emerald Isle, and made himself a home in the Golden State in the early days of its notoriety. Mr. Pryal, senior, is a horticulturist of note, and one of the first to engage in that business on this coast. On this fruit-ranch are found many rare fruits, shrubs, etc. He was the first to import several varieties of plums from Japan; and the other rare specimens in the horticultural line, in which he has been and is interested are too numerous to mention. Owing to the dull times and the great railroad

strike, fruits of all kinds were wasting on the ground. Nearly all of a fine cherry crop was lost. Pears, peaches, apricots, plums, were rotting in profusion.

Mr. Wilder and myself made a pretty good market for quite an amount of fruit; but the market could not stand the shock of such a variety, and soon became overstocked.

Wm. A. has been interested in bees several years, but has never owned as large apiaries as we see in Southern California. His present apiary numbers about 50 colonies. The yields of honey here are not so astonishing as we find further south. The resources are from a different flora, or, rather, a more mixed flora, and the honey is several shades darker than our white-sage honey. I was pleased to note, among other honey-producing trees, the linden, or basswood, growing thriftily on the avenue. This is a fine shade-tree here, and I have seen it in a limited way in other cities on this coast. Its growth demonstrates that it will thrive in any moist locality, either from ocean humidity in the shape of fogs and rain, or in the irrigated districts. Although its habit is not so beautiful as the evergreen pepper-tree, its honey is so far superior that it would be a blessing to bee-keepers to see it replace the pepper-tree.

Although the honey produced here does not rank as the whitest, its flavor is such that Mr. Pryal finds a ready sale and good prices for all he can produce. The dovetailed hive with all its appurtenances is used, and is considered the best all-round hive for this locality.

Mr. P. has recently directed his attention to queen-rearing; and though the past season has been a dull one he started off with many customers. His location is excellent for shipping queens to the various islands of the Pacific and to Australia.

Mr. P. has two efficient helpers in his younger brothers; but I fear the male trio of bee-keepers in this family will soon give up the bee-business. Wm. A. is just now interested in furthering the interests of the New Water Co., of Oakland; Charley and the other brother are mechanical geniuses, and are going to make things hum with electricity. I greatly fear that the care of the apiary will devolve upon the several young ladies in the house. I have no doubt but they can rise equal to the occasion when the occasion arrives. Among other distinctions, Wm. A. and the other brothers and sisters are native sons and daughters of California.

APIARY OF W. A. PRYAL, NORTH TEMESCAL, CAL.

The next day after our arrival, Aug. 4, we followed the footsteps of our host and tramped over the hills to the State University. Berkeley is chiefly noted for having this California institution located within its limits. Prof. C. W. Woodworth had attended our State convention; and the University, or the department under his care, was making an honest effort to aid bee-keepers, and disseminate knowledge in relation to the honey-bee. We three felt it our duty to call, and also help in our feeble way. Although the University was enjoying a vacation we found Prof. W. at his post. In his laboratory in the Agricultural Building we were shown bees preserved in alcohol, in all stages of development, from the eggs to the mature bee. In the attic were stored the vari-

ous implements for the successful management of bees. Prof. W. had tried to work a colony of bees in this attic; but as they had to fly up some twelve feet to the cupola above for an exit, and would just as often fly still further up and dash their brains out against the skylight, their usefulness was much curtailed, and the plan abandoned. Prof. W. will next make a platform in the cupola, and conduct the entrance through the slats. In this way the bees will have a fair field all to themselves, and escape the dangers of the skylight.

The department in which Prof. W. labors is ready and willing to aid bee-keepers in the way of experiments or the naming of various honey-plants now unknown to bee-keepers. The bee-keepers of the State are alone to blame if the University does not seem to make much advancement. With a proper backing by the fraternity, great results might be expected from the State University.

Prof. W. kindly escorted and introduced us to the various features of this great University. The great oaks, among which the buildings are located, and the multitude of other trees and shrubs from every clime the sun shines upon, make this feature alone one of deep interest. The honey-bee can here revel in blossoms, the native home of which is in the tropics, thousands of miles away; remote islands also contribute their floral treasures. We felt as though several days might be spent here profitably instead of a paltry hour or so. The professor returned to his duties; and as the shades of night were falling, we roamed over the hills again to the Pryal home.

EXPERIMENTS IN FEEDING BACK.

By R. L. Taylor.

Ed. Gleanings:—At your suggestion, that I give my views of your comments in Jan. 15th No., page 64, upon the results of my experiments in feeding back, I will attempt to point out some of the things which you appear to have strangely overlooked in your criticisms, and which, it seems to me, have led you to arrive at faulty conclusions.

As to the market price of the kinds of honey under consideration, you say: "According to the Honey Column in this issue, extracted honey of good quality brings at wholesale 7 cts., and comb 12." Now turn to the Honey Column of that issue and you will find that, in the markets most accessible to us, viz., St. Louis, Chicago, Cleveland, Detroit, and Cincinnati, the best comb honey ranges in price from 14 to 16 cts., and white extracted from 5½ to 7 cts. Now, you must admit that it would be fair, for the purposes of the calculation, either to take the highest price of each kind or else the lowest price of each kind. It evidently would not be just to take the highest price of one and the lowest price of the other to work out the comparison. But you by some oversight have done even worse than that, for you have taken 7 cts., the highest price of extracted in these quotations, and 12 cts., not the highest nor even the lowest quotation, of white comb honey, but 2 cts. below the lowest for the price of comb honey.

Your second error appears in your valuation of the sections which were given to the bees to finish. You say they ought to bring 8 cts.; but, consider that in five cases 140 of them weighed but 41 lbs. less than one-third full, and you will see that they are not only not salable but actually worth less than extracted honey for the purpose of extracting, on account of the labor and loss in weight that must be incurred if that course is taken with them; so I have put them at 6 cts., when 7 cts., the highest price of extracted honey, is taken; but when the lowest price, 5½ cts., is taken for extracted, I have let the sections go in at the same price.

Now, taking the figures of the same hive which you considered, let us make the calculations, both with the highest market and the lowest market prices, and see how far I was wrong when I said the profit was more than 50 per cent.

41 lbs. sections at 6 cts., $2.46; 106¾ extracted honey at 7 cts., $7.48; a total of $9.94; 110¾ lbs. finished comb honey at 16 cts., $17.72. Dividing $17.72 by 9.94 we have a quotient of 1.78+, showing a profit of 78 per cent.

Again, taking the lowest market prices we have 147¾ lbs. given the bees at 5½ cts., $8.13; 110¾ lbs. comb honey at 14 cts., $5.51. Dividing $15.51 by 8.13 we have a quotient of $1.90, or a profit of 90 per cent. So when I said 50 per cent, I might reasonably have put it 50 per cent higher, unless there is something valid to be found in the further objections you make. You think the labor of feeding would largely offset the 23½ per cent gain you figure. But, notwithstanding what you say, will not the improved condition of the colony more than offset the labor? I think so. I do not know how much this hive gained in weight; but in my experiment, made in 1893, seven colonies gained on an average about 8½ lbs., which alone would repay the labor. Then you object to the greatly increased amount of brood as being probably of no use. Consider at what time of the year this additional brood will hatch—in the latter part of August and the first of September, just when they are wanted to get the colony through the winter in the best possible condition. In my estimation this would pay for the labor again.

You are of the opinion that, in my experiment, the conditions were more than ordinarily favorable. In fact, they were quite the contrary. The colony was far from strong—hardly up to the average—as at no time during the season had it more brood comb that the equiv-

alent of five L. combs. No attempt was made to do a great thing, but only to show what could be done under very ordinary circumstances. Then another adverse circumstance was the fact that the unfinished sections contained much less honey than would ordinarily be the case—a fact that would seriously reduce the apparent profit.

It can be hardly be seriously claimed that Mr. Unterkircher's experience furnishes a case in point. It was clearly a case of gross mismanagement for which there was no kind of excuse. Whatever his intentions were, he evidently permitted the bees to store the honey fed in the brood-chamber.

Lapeer, Mich., Feb. 4.

[I fear I shall have to eat humble pie a (just) des(s)ert I don't like. My only excuse was carelessness in looking over the market reports, and I am the more sorry that they appear to favor my position. It was unintentional, however. My eye must have dwelt too long on the California reports of the previous number.—ED.]

THOSE STRAWBERRIES.

A POINTER.

By M. Dea.

Blamed if I don't believe Bro. A. I. Root's a crank—just like me—on the subject of strawberry culture! Just about the full o' the moon at this season of the year the fit comes on—lie awake o' nights thinking just how and what kind to plant. I rather think the hill system is yet the best all-round method, every thing considered, and that the Timbrell, take 'em all in all, is about as good a berry as any—not but that other kinds do excellently, and really should be a part of the patch, if for no other reason than help fertilize it thoroughly; but, you know, we've all got a particular fancy for some kind.

But this must be considered: Strawberries are powerful pesky things to disappoint a fellow just when he doesn't want any foolishness. You hear of a certain kind that Bro. Jones has, that he says bears so and so many quarts to the square rod. It sounds pretty big—heaps o' money and lots of fun in those berries. Bro. Smith resolves to have a half-acre, even if it costs his muly cow. Oh, yes! the plants come on—look fine; has his land just so—as recommended: gets Mandy (that's his wife) and Liza Jane to come over to help set the plants, and they nearly break their backs; and, there! now all those berries have to do is to get right up and hump themselves to produce the stuff that sells at big prices for small quarts. That's it. Hang up the old tin pans, and make awful-looking scarecrows to keep the birds off that patch; and, Mandy, be sartain to shoo off the chickens and the boys.

June comes along finely; the plants look perfection; leaves like spinach, almost; buds a startin', big as buttons on Liza Jane's winter coat: yes, right down *blossoms*, or I'm a hen. Well, well! now that's what I call big luck. Rushy Ann! Why, that means a big sum in our county bank, sure. Now let me see — 40 and 39 carried several times is so much, and so many of the last picking is so much; in all—Riah Jane! hoopie! whew! Why, there'll be 'nuff money left, after paying the mortgage, to buy the old lady and darter each a fine dress, bonnets, and folderolls. Oh! I'm smart, *I* am! Honey and slap-jacks! What ails them meechen things? In a week the whole passel of buds and flowers has shrunk—actually turned yaller, and in July there aren't berries enough to make a respectable shortberry strawcake! That was the beatenest swindle!

No, it wasn't. The man you bought your plants of was all right—in *New Jersey;* what he said was so too; but his land is different—more gravel; yours is all rich loam, and that makes a world of difference in results. So you see the kinds that do so well on a special soil will hardly fruit at all on some others. Sabe?

THE DOVETAILED CHAFF HIVE.

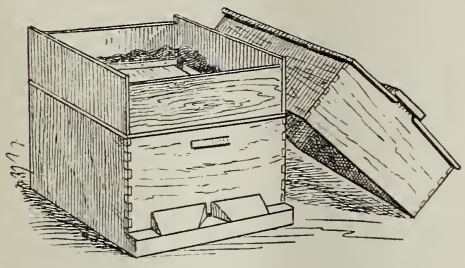
FOWLS' IMPROVEMENT.

By Chalon Fowls.

I send you by this mail a photo of the Dovetailed chaff hive with some improvements which are new only in their adaptation to the Dovetailed chaff hive. One thing I really felt the need of was handles. They should be made by nailing strips on the hive ½ or ¾ inch thick by one inch wide by 4 or 5 inches long. I prefer them in the middle of each end, and one inch below the water-table. If you ever try to move one of these hives when filled with bees and honey I think you will appreciate handles. There is no reason why these hives should be any more clumsy or inconvenient than the old style Langstroth, which they very much resemble. One of the conveniences of the old-Langstroth was the entrance-blocks. I've been bothered a good many times in the last dozen years in closing the entrances of chaff hives. Sometimes robbers would commence on a weak colony, then I must hunt for a stick. If too long or too thick it must be whittled; if too short or too thin, I must hunt another, the rascals all the while piling into the hive.

A 2x2-inch piece should be nailed on ⅛ or ¼ inch below the entrance, so water will not run into the hive. Being 2 inches thick it makes a good alighting-board, and the front side is left rough along in the middle so they can stick

their toe-nails in to climb up, if they should bring in such "dead loads" as to fall short of the entrance (which provision was entirely unnecessary this year, as a gimlet-hole might have answered for alighting and entering). The three-cornered block formerly used for an alighting-board is sawed in two to make entrance-blocks, sawing a little piece out of the middle as shown in the picture. It is shown



nearly closed, as used to keep out robbers. But the most important feature is the tray to hold the top packing. The chaff cushion is all right for the old-style chaff hive. The old chaff hive admits of its being tucked down snugly in the corner so as to prevent drafts, yet secures perfect ventilation up through the middle of the chaff, because all dampness can pass off at once, *owing to the space between the cushion and the roof*. Now, this requirement is not met with the cushion in the Dovetailed chaff hive. The inside of the cover will become wet and moldy, as also the cushion. This tray secures all the conditions connected with the use of cushions in the old-style chaff hive.

Ten years ago I visited Mr. J. S. Hill, at Mt. Healthy, O. He is the author of the Hill device. I visited a few days with Mr. Muth, and he told me I must not fail to go to see Mr. Hill, as he had the best-kept apiary in the State. When I saw it I concluded Mr. Muth was not far out of the way. He had a hundred or more colonies in Langstroth hives: no grass was permitted in the apiary, but he had a stalk of flax to shade each hive. This was in the fall, and he was just cutting down the dead stalks. Each hive was provided with a Hill device and tray. I did not notice how his were made, but I'll tell how I made mine. Either the sides or the ends should be 6 inches high, so as only to let the cover telescope over the rim-piece one inch. I made the sides from the crating the hives came in. The ends should be short enough so the sides can be nailed on to them, and leave the tray ¼ inch less each way than the inside dimensions of the cover. The boards for the ends should be sawed off perfectly straight, otherwise the tray will be diamond-shaped, and the cover won't slip on and off freely. It would be better to have the ends cut at the factory, as it bothers "some folks" to saw a board off accurately.

To cut the burlap for the bottom, spread it out, and, taking the tray for a guide, cut an inch larger all around. To nail on, lay on a table or bench; put the burlap in with the edge sticking up in the inside, and fasten with thin strips, say ¼ by 1 inch, clamping the cloth fast. It takes but a few nails this way. A brick laid under while nailing will make it loose enough to cover the Hill device, or whatever is used across the frames for a winter-passage.

For packing I shall use maple leaves for the tray, as they are easy to get—no grain mixed in to entice the mice to make nests, etc. In the spring they may be thrown away and fresh ones got in the fall.

While discussing the matter of hives, I wish to call your attention to a point I mentioned to you three or four years ago. I told you that your flat covers for the Dovetailed hives were too thick. Mine were only ⅜ and ½ inch thick. You were afraid the thin cover would warp worse than the thick ones. Well, after having had an opportunity to compare them since then, I want to repeat what I said then, that the thin cover will not warp or wind nearly as much as the thick ones. You see, there is not as much wood to strain on the end pieces, which are just as heavy as those on the thick ones. In proof of this I will say I have covers only ⅜ inch that I have used at least ten years, that are still as straight as ever. I don't think I should like the Higginsville cover as well as these.

Oberlin, O., Dec. 1, 1894.

[The tray may possibly give better results than the simple cushion; but as we have had good results with the latter, we have given it the preference in our catalog. The tray, if made of rough three-eighths crating, would be cheaper than the cushion, and would be easier to pack. We do not as a rule ship the hives with cushions, as each bee-keeper is supposed to fix up for himself what he likes best. I commend Mr. Fowls' arrangement. About that three-eighths-inch cover, I should like to hear from others who may be using them. I have been afraid that they would check.—ED.]

LAYING CAPACITY OF QUEENS.

Question.—I see that very many of our most practical apiarists are recommending eight Langstroth frames as the right size of brood-chamber for a strong colony of bees. Such eight-frame Langstroth hive, if entirely occupied with worker comb, contains 1168 square inches of comb, or about 58,400 cells. From this we must deduct at least 10 per cent of the space for the usual supply of honey and pollen, leaving about 52,500 cells. Allowing 21 days for the bee to hatch, and one day for the bees

to fix the cell and for the queen to lay in it again, we have an average of a little less than 2400 cells for the queen to fill per day. Now, is 2400 eggs the utmost daily laying capacity of a queen in a strong colony? and if not, should any queen be restricted to that amount when she could and naturally would lay more? I ask these questions to help me determine what size of hive to build this winter, having up to this time supposed that a ten-frame L. hive was the smallest hive that could be profitably used.

Answer.—If a colony of bees having a good prolific queen is given 30 Langstroth frames, using but 8 to start with, and adding two or three at a time, as the bees can occupy them, until the 30 are all in, it will be found that such a queen will lay from 5000 to 6000 eggs daily, during the best part of the egg-laying season, and die of old age or exhaustion when but 18 to 24 months old; while with the 8-frame brood-chamber she will give as good results in comb honey, if not better, each year, and live for four or five years. I take it for granted that our questioner is a comb-honey producer, although he does not say so, and shall give my views of the matter wholly along that line. With the large hive the bees are quite likely to get the start of the queen, and commence to store honey in the brood-combs before entering the sections at all, and in such a case the bees seem loth to go into the sections, and continue to store honey in the brood-chamber in preference to going into the sections, thus crowding out the queen with honey in the comb which ought to be occupied with brood, till we have as a result very little section honey in the fall, and a colony in poor condition for winter. Besides, it is well to remember that all queens are not equally prolific; and while 20 per cent of our queens would keep the brood-chamber of a ten-frame Langstroth hive properly supplied with brood to give the best results in section honey, the other 80 per cent would not be prolific enough to do so; hence in the majority of the hives in the apiary we should have a condition working against our best interests, which could not be overcome by the extra amount of comb honey produced by the 20 per cent whose queens were prolific enough to work in these ten-frame hives to advantage. For these reasons it would seem best to adopt a size of brood-chamber which any and all queens, which were worth keeping at all, would have occupied with brood at the commencement of the honey-flow, thus securing the best yields of surplus section honey at all times. Because a queen may lay 6000 eggs daily by using plenty of comb capacity and coaxing, it does not necessarily follow that it is to the best advantage of the apiarist to accommodate or even coax a queen to bring her fullest laying capacity to the front at any time. Queens, in any well-regulated apiary, are among the smallest part of the expense incurred, while labor, hives, and combs go toward making up the larger part of the same. For these reasons I claim that the capacity of the queen should rather be above the capacity of the brood-nest than below it, so that all combs may be fully occupied with brood. Unless this is the case the outside combs continue, in most cases, to be dead capital from year to year, unless we argue that they are necessary to insure the safe wintering of the bees. After an experience of over 25 years, I can not consider any argument along this insurance line as aught but fallacious.

Again, suppose that a queen can average 5000 eggs daily for a certain period. What is the price or worth of those eggs? Does the sum and substance of bee-keeping depend on keeping all queens employed at egg-laying to their fullest capacity? Bees, when they come on the stage of action at just the right time, are very valuable; but eggs are of no value, only as they tend in the direction of producing these valuable bees. Aye, they tend toward a positive disadvantage, and to take away the value we already have, only as they are looking toward the end of producing the required bees in the field at the time of the honey-harvest. Here is a point often lost sight of by the large-hive advocates. As I said before, eggs cost practically nothing; but as soon as the bees begin to perfect them toward bees, then they begin to cost; and if this perfecting is going on to any great extent at a time when the perfected product is placed on the stage of action either before or after their presence in large numbers is needed, we not only have the cost of their perfecting to pay for, but the cost of their consuming, after being perfected, as well. This consuming part, we always have to pay for; but we willingly do it at any time when the production of the individual bee is greater than its consumption. But I can see no object in doing this at any other time, simply that the extra laying capacity of any queen may be gratified. A hive that is large enough to gratify the greatest aspirations of very prolific queens, at the times of these greatest aspirations, will have too much capital lying idle in it the largest share of the year, and be a bungling hive at that. From all past experience I think that 2400 eggs per day would be a good maximum average for any queen. Rain, cold, or other disturbing influences often retard the activity in the hive and of the queen, and thus it happens that at times the best of queens often do not lay more than 1000 eggs in a day, while, with the right conditions, she may multiply this number by four, and still have plenty of room in a hive which will give an average of only 2400 daily. Then, again, as two and one-seventh generations of bees can be brought on the stage of action to where one steps off, we find that, in a hive giving an average of

2400 bees daily, we can have in that hive, if properly managed. 108,000 bees on the stage of action right in the honey-harvest, when their productive power is the greatest; and at such a time such a number of bees are a host to roll honey into the sections with the combs all filled with brood below; and this rolling of honey into the sections, means the rolling of money into the bee-keeper's till. Experience has shown these men who are advocating an eight-frame L. hive that such is the best, as this keeps the frames full of brood, and puts honey into the sections. However, all our questioner (or any one else) has to do is to use part ten-frame and part eight-frame hives in their apiary, when a little time will satisfy them which is best.

In order to make a symposium on the subject of bee-paralysis, we have concluded to hold over Mr. Baldensperger's article, which we promised for this issue. A valuable one on the same subject will be given from the pen of Dr. J. P. H. Brown, of Augusta, Ga.

The editor of the *Review* echoes the same thought that has come to me at times regarding the value of other bee-journals besides our own. He says:

Apicultural literature was never better than it is to-day, and this in the face of about the hardest times financially and apiculturally that we have seen in a long time. As journal after journal came in for December, all bright, fresh, well-printed and illustrated, and crammed with interesting and helpful articles, I fell to wondering if my own journal appeared as attractive to the other editors as theirs did to me. If it did I am satisfied. Bee-keepers have every reason to be proud of their literature.

"Honey-bee Concert" is the title of a leaflet gotten out under the auspices of the Ontario Bee-keepers' Association. It took place on Wednesday, Jan. 23. Its object was purely educational, designed to bring in outsiders. I have no doubt it was a grand success. The following is the program that was laid out:

1. Instrumental duet, Mrs. Scarff and Mrs. Bruce. 2. Address by President A. Pickett. 3. Quartette, Misses Mark and Eason, and Messrs. Irving and Hepburn. 4. Solo, Mrs. Stone. 5. Address by Hon. John Dryden. 6. Solo, Mr. H. F. Gadsby. 7. Recitation, Mildred Gemmill. 8. Magic-lantern exhibition and lecture, Mr. R. F. Holtermann. 9. Violin solo, Mr. R. W. Roberts.

It could hardly fail to be entertaining and educational. The scheme is a good one, and I hope it may be repeated in some form at the next N. A. B. K. A., to be held at Toronto.

D. A. JONES, PAST AND PRESENT.

I learn from the *Canadian Bee Journal* that one of the factory buildings (the largest) of the former D. A. Jones Co., Limited, went up in fire on the 30th of December last. Beeton has been very unfortunate in its fires. The office of the *Canadian Bee Journal*, founded by D. A. Jones, was burned out once, and now virtually all that remained of the once large supply business with it is gone also. The building was used for other purposes, and was owned by Dr. Cheffy at the time of the fire.

By the way, where is our genial friend of old, D. A. Jones, whose fame shot forth so like a meteor? There was a time when he was the leading bee-keeper of Canada, the leading bee-editor, the leading supply-dealer, a leader in apicultural thought, and a man known the world over. He traveled over the Orient, and spent thousands of dollars in the pursuit of new races of bees, and later established queen-rearing on islands of Georgian Bay. While we remember him for his brilliant past it would be a pleasure to know something of his present, even though not a bee-keeper now.

THE PRESENT WINTER, AND WHAT IT MEANS TO BEE-KEEPERS.

In our locality we have not had for years such prolonged and severe weather with high winds as we are now having. We scarcely ever have more than ten days or two weeks of cold weather, and then we have a thaw and a few warm days. But up to date, Feb. 8, our bees have not had a flight since Christmas. Indeed, the mercury has scarcely been up to the freezing-point. For the past four days it has been hanging, both day and night, close to zero—scarcely varying a degree one way or the other; and, more than this, there are high winds. I am well aware this is not cold compared with some localities. Indeed, Dr. Miller says, in the first Straw in this issue, that his thermometer showed 23 below zero on the morning of the 5th; and I doubt not it has been very much colder in other northern localities. Well, then, if this winter is so much colder than former ones, which I think it is, it is going to be a terribly hard one on bees, for bee-keepers have a habit of preparing rather for mild winters than for severe ones. The result will be, unless I am very much mistaken, and unless the weather moderates considerably, that there will be severe winter losses, and, as a consequence, there will be discouraged bee-keepers with a lot of supplies on hand, perhaps unpaid for. But it is the outdoor colonies that will suffer, I fear, and particularly those that have not been put into double-walled hives or winter cases. I do not wish to forebode calamity; but I think it would be well for bee-keepers to consider the possibility of their losing heavily, and therefore not requiring the supplies that might otherwise be needed. I am well aware that this

may chop off some of our orders; but I think it is only fair for bee-keepers to be properly on their guard.

Now let us turn to a more encouraging view of the situation. Cold winters, accompanied with snow, as is this winter, are said to mean an abundance of clover; and that, of course, means honey. The moral is, *save* your bees and get the honey.

BOGUS HONEY.

The following letter will explain itself:

Friend Root.—The attached letter was received by me in answer to an advertisement for a situation as stenographer or book-keeper. As it seems to settle a number of questions in regard to bee-keeping, I thought it might interest you. The "king bees" had better get together and form a trust or they will soon find their occupation gone. W. HICKOX.

Lakewood, O., Feb. 2.

And here is the letter referred to. It is very evident that Mr. McCarthy got hold of the wrong man. It is a little surprising that he should "give himself away" quite so bad.

Box 108, Lakewood, O.:

Dear Sir:—Do you care to take an interest in a good paying business? I have an article whose merits are unequaled in the markets: it is manufactured honey, made from the oils and extracts of flowers that the bee gathers its honey from. I put it up in 1-lb. jars, labeled and sealed ready for the market, at a cost of 7 cts. per lb. It retails at 20 cts. per lb. I am a poor man, and have to work for my living. I have not got the money to go ahead with, and want some good honest man to take one-half interest and help me put the goods on the market This is a good chance for the right party; so if you do not care to investigate, perhaps you have a friend who would. I have explained the best I can at present. Hoping to hear from you soon I remain

Respectfully yours,

1732 St. Clair St., Cleveland. W. J. MCCARTHY.

I thought best to give our readers the contents of the letter from Mr. McCarthy. I do not know certainly whether he intended to put this manufactured "stuff" on the market as pure honey or not; but the presumption is rather that way. Mr. McC. says he is a poor man and wants some good honest man to take an interest in the business. Honest man! it would be hard to find one who would engage in that business—that is, *providing* he proposes to sell bogus honey for the pure. If any of our readers in Cleveland are located where these goods are sold they will oblige us by giving the particulars.

ADVANTAGE OF CHAFF HIVES IN THE CELLAR.

WE have generally supposed that single-walled hives were plenty warm enough for cellar wintering: that to put *chaff hives* in such a place was both an unnecessary expense and a waste of cellar room, to say nothing of the work of toting these unwieldy things, full of bees and stores, up and down steps back and forth. Notwithstanding it looks like wearing an overcoat in the house, Doolittle has decided (see *American Bee Journal*) that it *pays*, both in the saving of stores, and the better condition of the bees. This conclusion he has reached after some carefully conducted experiments, and now not only seven-eighths of all his colonies are in chaff hives, but three-fourths of them are in the cellar. His chaff hives have loose bottom-boards, and are raised up from the same while in the cellar by blocks of stove-wood. In summing up he says:

I have just been in to see them, so that I might tell the reader the difference between these and those in single-walled hives. Those in the single-walled hives are clustered closely on all parts of the cluster—bottom, top, and sides—the same as they would be outdoors, only not quite so completely; while those in the chaff hives are clustered just as closely as the others at the bottom of the cluster, and a little way up the sides; but as you come toward the upper half of the colony, the bees stand out around the combs the same as they would in summer; while at the top, all along next to the cushion and cotton cloth, they make no pretension at clustering whatever, although you can look at them a long time without any of them stirring, no matter how close you hold the light to the hive. In this way they have free access to all parts of the hive, so a colony never starves, so long as there is any honey in the hive, by their eating the honey from one side and failing to move over, as is frequently the case.

But the greatest item of the whole is, that these colonies in chaff hives do not consume nearly as much honey as do those in single-walled hives, while the safety of their wintering successfully is more fully assured; for the less honey consumed by a good colony of bees insure their more perfect wintering. Where hives are wheeled right into the cellar, as I do mine, the labor of putting them in is little more than with single-walled hives, and this labor question is all there is against the matter, except that a less number can be put into a given space; and the saving of honey will, I think, more than compensate for the extra room needed, and pay for building a little larger, where it should be necessary.

I am inclined to think Doolittle is right. At all events, it would be well for a few others to try the same experiments. If you have any double-walled colonies out doors that look as if they would go up before spring, put them in the cellar now. But, say—it occurs to me that the great majority of the makes of chaff hives, perhaps all of them, have tight bottoms. Colonies in winter cases can be so tried at all events.

FIVE-BANDERS RECEIVING MORE HARD KNOCKS FROM BEE-EDITORS.

THE editor of the *Canadian Bee Journal*, after stating that he is as anxious as any one to have bees which will give large yields of honey, which are easily handled, and which have beauty, says this:

Were we to engage a man or maid to perform our work simply on account of looks, it would be

better for us to give up business or for our friends to lock us up in a lunatic-asylum. We think it would be well for bee-keepers to examine themselves and see what leads them to be favorably impressed with the "five-banded Italian bees." Is it not their beauty? Should they not rather regard that as very secondary, and look for the primary requisites before launching out in eulogies? We have tried various five-banded queens from what were supposed to be the leading breeders of these bees. They have thus far done nothing remarkable in the direction of good works, whatever they may do during the coming season. Thus far we have not found them particularly good for building up—rather to the contrary. Next, although they showed no marked trait when in a normal condition, we have found the workers in two instances, being every instance in our case, very irritable when in that condition. We remember a queen secured from a lady in the South in the fall of 1893. A good big price was paid for the queen, and also a second purchased. Although going into winter quarters strong in bees it was in poor condition in the spring, and was on only three frames when the next poorest was on eight. After a great deal of trouble, and the refusal on our part to add another $5 to the returned queen and get a "*first-class*," we had the offer to give us a $5 queen at half the price of the first. This we accepted, and the queen came to hand, with the admonition that, for $5, the progeny would not be all five-banded. They can not, therefore, be considered a very fixed strain of bees.

Last year the Ontario Agricultural and Experimental Union took in hand to make tests with these five-banded Southern queens. Five queens of the leather-colored Italian strain were also supplied—in all, 25. The queens were supplied between July and October 2, and they are to be tested for gentleness, longevity, honey-gathering qualities, etc. Thus far every one having the leather-colored Italian and the five-banded Italian, without soliciting this fall a reply in this direction, mentions the superiority of the leather-colored queen as to prolific qualities. Four of the five-banded queens have already been superseded, which does not speak well for their longevity; several were also lost in introduction. We notice that the Vermont bee-keepers are, at their coming convention, to discuss whether it is advisable, in view of the prevalence of bee-paralysis in the South, to purchase queens from there. If those wide-awake Vermont bee-keepers begin to doubt the wisdom of such purchases, the rest of us may well hesitate. Let us not add another disease to battle with.

I also notice that Editor Leahy, in the last *Progressive*, pays his respects to them in this fashion:

I have never received a so-called "five-banded" queen from Mr. Doolittle, but 4 or 5 years ago I ordered one direct from Mr. Hearn, paying him $3.50 for her, this being his price of tested queens. This queen produced the most worthless, and at the same time most vicious bees that I ever had any experience with (hybrids not excepted), they being small, with a black shiny spot at the end of the abdomen. The following winter they dwindled away and died on the summer-stand, yet they were packed in sawdust. Since then I have ordered five-banded queens from a number of other breeders with some very good results and some very bad.

Editor Alley, in the *Apiculturist*, has been giving those golden fellows "regular fits." Editor Hutchinson, in the *Review*—well, I can't find where he stands, so I'll put him on the fence, and Editor York beside him. I have been on both sides of the aforesaid fence; but I have stayed longer, and on the side of the opposers of the yellow fellows; indeed, I feel more inclined to stay there because the majority of the testimony seems rather to be against them (the yellow bees).

OUR RELIGIOUS PAPERS AND ELECTROPOISE.

We copy the following entire from *Electricity* of Jan. 9, 1895:

There can be no defense. The publications accepting that advertisement confess a willingness to make money by aiding a swindle. Yet the *Churchman* has the hypocritical effrontery to descant upon the evils of the Sunday newspaper:

"The discussion of the Sunday newspaper at the Church Congress gave much satisfaction to Christians interested in the preservation of the brief hours of the Lord's Day for the development of the spiritual nature of man; and the words of the more seriously minded of the speakers were uniformly devoted to impressing upon churchmen the inevitable loss sustained by those who either neglect divine worship for the attractions of the Sunday newspaper, or attend the services of the church with minds and hearts indisposed by such reading, to receive their hallowed influences."

The evils of the Sunday newspaper, however great they may be, would better be pointed out by some paper like the *Sunday School Times*, the *Christian Advocate* of New York, or the *Western Christian Advocate* of Cincinnati, papers whose advertising space is not for sale to promote a fraud, and which can at least come into the discussion of a moral question with clean hands.

We do not know how many other religious papers are still carrying the Electropoise advertisement, but the stain of dishonor and corruption rests on every one of them.

The moral is so plain that we need not add any thing. However, I wish to call attention to the excellent recommendation they indirectly give our old friend the *Sunday School Times*, in the above.—A. I. R.

CORRECTIONS.

On page 110, the senior editor, in speaking of the cement pavement used in Jacksonville, meant to say that it is a sort of limy *marl* instead of *marble*. He says his amanuen-*sis* wrote it marble, and that he is sure he corrected it; but there it stands, as plain as print, without a mark on it, *marble*. On page 111 he meant to speak of the children as being *neatly* dressed, and not *motley*. There being no loop in the top of the *e*, the word looks just like *motly*, and we supplied the last *e*, thinking he had omitted it by a slip of the pen.

A. I. R. is again writing on the subject of bees (see this and next issue), with his old-time enthusiasm, of what he sees in Florida. I speak of this because he has not written on apicultural matters to any extent for a number of years. His writings have been confined largely to general subjects of travel, gardening, and things that pertain to our general conduct and its relation to heavenly things.

OUR RAILROADS AND RAILROAD CORPORATIONS.

It is so common to hear complaints in regard to our railroad companies that it may sound a little odd to say a word in their favor. So far in our experience, however, we have met nothing but the kindest courtesy. My wheel was laid down here in Jacksonville without a bit of expense. Of course, we checked it as baggage, and our luggage was laid down at our *rooms* at a very trifling expense. Porters were gentlemanly and exceedingly obliging. I met one of them on the streets of Jacksonville after I had been here a day or two, and I was really glad to shake hands with him, even if he is colored. By the way, I have heard people speak of the insolence and exorbitant charges of the waiters here in Florida. So far we have seen nothing of the kind, but quite the contrary; and I have been wondering if it is not true that education is beginning to tell on these people. I have been studying them, their ways and habits, very intently since we came here, and I think I can say this: They not only seem to be exceedingly good-natured, cheerful, hopeful, and full of spirits, but they are, as a rule, industrious working people. Quite a little excitement has been occasioned among them by the advent of the Dahomey Village that appeared at the World's Fair. They have a tent here, and have a street parade during the day. The enthusiasm among their own people here in Jacksonville is almost wild. A circus or show entirely in the hands of full-blooded Africans from their own country is to them an event unprecedented. These native Africans are models of physical health and development. There seems to be a pretty sharp line drawn between the colored people and the whites in this city. Where they do business back and forth, each race seems to keep within certain limits; and I am told intermarrying and amalgamation is comparatively rare.

When I explained to the different railroad officers here where I wanted to go, and told them what I wanted to do, they were more obliging than I had any reason to expect; and not only in the way of giving me full directions and assistance, but in making very reasonable charges.

IN SAN MATEO.

This morning we are at A. F. Brown's beautiful ranch. The most conspicuous object on the grounds is the magnificent great live-oaks with their spreading branches draped with festoons of Spanish moss; in fact, nowhere else in our travels have we seen either, in such wondrous perfection. It is our pleasure to meet here two bee-keepers of considerable prominence—V. V. Blackmer and Chas. D. Duvall. Mr. Blackmer has been associated with friend Brown in his bee-business; and friend Duvall, the queen-breeder, is assisting friend Brown, and raising queens for himself. There is a point right here, friends, that may be worth while to consider. After a bee-keeper away up north has his bees safely put away for the winter he can come down here and have lots of fun, and, may be, do some good by following his chosen pursuit all winter long. The principal drawback is the expense of so long a trip; and I hereby petition the railroad companies to make a low-rate round-trip ticket especially for bee-keepers to come down, say in December, and go back about the first of April. It would be a comparatively easy matter, it seems to me, for a hundred bee-keepers or more to club together and send in a petition before next winter. GLEANINGS and the other bee-journals will, without doubt, help it along, and may be we editors could take a trip down and look the boys over and see whether they behaved (went to meeting Sundays, etc.), when their wives were not around—that is, providing said wives did not go along.

Now for the oaks and moss: One great oak right close by the house—in fact, it shades quite a part of the extensive verandas—has great spreading branches that actually measure from "tip to tip" something like 90 feet. Imagine a large symmetrical apple-tree occupying a circle nearly 100 feet across, and every limb and branch draped with delicate lacework of this beautiful moss. Now imagine these long tresses rippling in the wind like the soft flaxen hair of a playful child.

Our friends mentioned have just been transferring bees from box hives and log gums into the latest pattern of improved hives, sent by carload lots from a place away up north, where a lot of Roots, old and young, work together to fix out bee-keepers down south and elsewhere. Perhaps you may be surprised when I tell you that these friends, in transferring bees, have actually made thirty-two in a day. The new hives under the waving mossy trees present a very pretty view indeed. We are promised a picture of it.

MIGRATORY BEE-KEEPING IN FLORIDA.

Friend Brown is making a specialty of migratory bee-keeping. He usually gets his first crop of honey here from orange, then he transports his bees by boat and rail to New Smyrna, or some place on the coast where his bees can get palmetto honey; then he goes to the mangrove regions on the coast, but ten or twelve miles from the palmetto country. After this he takes in the yellow-partridge peas on the pine lands of the interior; next he gets honey from wild goldenrod and sunflower on the prairie river-bottom lands, making four or five crops in a year. A single colony thus transported by way of experiment, gathered last season 576½ lbs. of honey; and an entire apiary (*he says*) can be made to average from 260 to 350 lbs. Mr. B. has made 16 moves in four years, with only two failures. Of course, much judgment and skill must be exercised in deciding when and where to move. He has kindly given us the following list of sources of honey which can be reached within a radius of from forty to sixty miles: Pennyroyal, December to February; orange, February and March; tyty, during March; tupelo gum, March and April; palmetto in May; mangrove in June and July; cabbage palmetto, July; yellow-partridge pea, August; goldenrod, September; sunflower, and goldenrod of another species, in October and November; maple in December and January; gallberry, March and April.

In this vicinity are acres upon acres of the most beautiful orange-orchards I have ever seen in my life; and at the present writing the ground is literally yellow—yes, sometimes heaped-up yellowness—with frosted oranges. Many fears are indulged in that the trees, at least many of them, are killed as well as the fruit. Of course, all the orchards are not up to such a standard of perfection as I have mentioned; and upon asking why one orchard showed such luxuriance of growth while the one adjoining was dilapidation and ruin, I was told it was all in cultivation and fertilizers; and our well-known northern brands, say the Bradley, Bowker, Mapes, etc., are being used largely with excellent results. I am very glad indeed to know this. I was curious to know whether the Florida rock phosphates were also used

here, but I am told they are not much used—at least in this locality.

There is no gardening going on around here; in fact, we have seen nothing I could call gardening as yet in Florida—hardly so much as a bed of onions, lettuce, or radishes; neither is anybody planting potatoes, notwithstanding the fact that Irish potatoes shipped from the North bring 40 or 50 cts. a *peck!* neither does any one keep a cow and pig, as we people do up north, and yet milk is 10 cts. a quart; eggs, 25 to 35 cts. a dozen, and other things accordingly. I have several times suggested having potatoes shipped direct from expert growers up north; but people here mostly buy a peck or so at a time; and it takes so many "middlemen" to get a carload of potatoes into the hands of the consumer that the expense would bridge over the difference between 50 cts. a bushel and 50 cts. a peck. Notwithstanding, I am sure there is an opening here, for both sweet and Irish potatoes are on the table at almost every meal, and I for one should like the fun of selling milk for 10 cts. a quart. If I couldn't get alfalfa or some other plant to furnish cow-feed it would be funny. I asked one of the milk-men, as he was going his rounds, what they fed their cows down south. He looked at me for a moment just as if he thought I was a meddlesome, no-account Yankee; but he finally answered in a sort of surly way, as he turned his back to me, "Cotton-seed meal and bran." Now, look here; why can't somebody get that cheap wheat and corn that comes from Missouri for 35 cts. a bushel, you know, down here, and convert it into milk at 10 cts. a quart? Why, there is a gold-mine in the speculation. You see, you don't have to lay out a great deal of money in frost-proof stables. Mr. Brown said a wire fence around the outside, and a cotton cloth for a tent-like cover over the top would be all the stable the cows would need.

Oh! just a word more about the moss. Friend Brown says it is an air-plant, and the only reason why it is found on the trees is that it wants a place to hang on, up in the air. He said it would grow just as well hanging across a wire fence as on a tree; but friend Blackmer says it isn't so. Mr. Blackmer is old and gray-headed, like myself, and knows a lot more than these young chaps, even if they have lived in Florida all their lives. I have a private speculation of my own, that perhaps we might feed the cows on the moss—that is, we would have the moss take the place of hay while we were feeding them on corn meal and bran.

THE PICNIC ON THE RIVER.

Bee-keepers are geniuses, as I have often said before; especially are the successful bee-keepers men of mechanical and scientific attainments. Friend Brown has an electric gasoline launch for running about on the river. The boat is only 21 feet long, and it is worked by a 4½-horse-power engine. To-day it pulled a string of three boats, loaded with picnickers. When I first saw the crowd that was to go, I feared the little launch would hardly handle them all; but it took us some eight or ten miles and back in fine style, I tell you. I think I never enjoyed a picnic more. The thing that added to my enjoyment was that I had a place close to the engine, and was enabled to study carefully its working. Almost twenty years ago (in fact, it was at the Centennial Exposition, in Philadelphia) I first saw a gas-engine. In this first crude affair the gas was exploded by a burning jet, and it sent the piston away up with a tremendous explosion. The modern machine occupies very little room for the power it generates; in fact, the *cylinder* is about the principal part of the machine. A small quantity of gasoline, measured out exactly for the work required, is turned to vapor, then mixed with the proper proportion of atmospheric air to produce an explosive compound. This compound is fired in the cylinder by an electric spark, and the force of the explosion gives the power. It seems almost incredible that all this could take place at each stroke of the piston when the engine made as many as five revolutions *per second*. I enjoyed most heartily every rod of our trip after I had the hang of the machine enough to see how it did its work. It really propels the boat by a series of "kicks"—yes, vigorous kicks—and the kicks are at the rate of five a second. Where is the kicker who can beat that? Now, mind you, besides this it occupies such a very small space that it can not possibly blow up, because it really *does* blow up five times every second—that is, all it *can* blow up. There is no boiler, and no reservoir of any thing but gasoline, and this is away off at the other end of the boat. Great precautions are taken to prevent this reservoir from letting loose the gasoline any faster than the engine uses it. By great carelessness the gasoline pipe *might* be broken so as to let the dangerous liquid out into the boat. Then if some one should throw a match into it, it *might* burn. But even in such a case, as the boat is always in the open air there could be no real explosion. The occupants might get their clothing set on fire; but all they would have to do would be to climb over into the water and let themselves down until the fire was out.

While I was enjoying seeing the thing work, I could not but reflect on the amount of brains and hard study that had, step by step, during these twenty years past, conquered obstacle after obstacle, and brought the machine to its present state of perfection. In fact, it seems almost impossible that any really valuable invention can come about in any other way. Not only must one man make it, perhaps, a life study, but other men, and often succeeding generations, work out these great triumphs of human intelligence over the forces of nature.*

By the way, friend Brown proposes, if I am correct, to make this gas-engine launch help him in his migratory bee-keeping. You see, he can put a pretty good-sized apiary on a cheap raft, or lighter, and then this little giant of strength and power, this compact "genii" of boiled-down power and energy, will take the whole apiary and fairly make it skim over the St. Johns River and tributaries, to any point where honey may be coming in. We just had the nicest crowd of boys and girls, in my opinion, to be found in Florida, or any other land; and let me say to you confidentially that Mr. Brown's little sister, who presides over his housekeeping affairs in a model fashion, is not one whit behind the rest of the crowd; and, by the way, what a grand thing it is to *have* a sister! Of course, you all know I think a wife is about the nicest thing in the world; but if one hasn't a wife, a sister is the next best thing. Dear reader, have you looked after that sister of yours as you ought? Do you realize what a gift, straight from the great God above, she is or ought to be? Suppose you go and tell her now what I am saying; and you may add, too, that I have had large experience, and am good *authority* in the matter.

The St. Johns River is one of the prettiest rivers in the world. Oh! I forgot to mention

* I hope our readers will excuse me for once more touching on Electropoise right here. These people have the cheek and effrontery to claim that they too have "evolved and studied up" some great invention and discovery, whereas they have been only hatching up a series of lies. So ingeniously have they built up their cause that one might well be deluded it he did not look closely into the matter.

that there is a host of *little* rivers, or sort of side issues, perhaps you might call them, that branch off from the St. Johns, and they turn and twist in every direction. The water in these little rivers is like that mentioned in Georgia. It has a brilliant dark color, from the roots of the tropical vegetation probably; and when the water is still it reflects the luxuriant growth upon its banks like a polished steel mirror. When we first came down to the St. Johns River I was agreeably surprised to find my old friend, the water-hyacinth, all along the banks, and lining the edges of the stream and its tributaries for *miles* and *miles*. Some places they grow out into the river for several rods. Here is a fact for our experiment stations. Friend Brown tells us that, six years ago, there wasn't a water-hyacinth on the whole river; but some one threw in a plant. Now there are acres and acres of it, and great clumps looking like little islands are constantly floating down. When we landed for dinner I discovered these plants sailing up stream—or, at least, so it seemed to me. I asked for an explanation, and was told the water of this river runs *both ways*—up stream when the tide is coming in, and down stream when it is going out. The women-folks of our party pitched into me because I remarked, "Friends, I have often heard of contrary women; but I have never before seen a *river* that changed its course, and went directly contrary in just one short twenty-four hours." The raftsmen, whom we found along the river, take advantage of this queer phenomenon for transporting their logs. They let their rafts loose when the current is in the direction they wish to go.

Somebody said there wasn't any good drinking-water in Florida; but after drinking several times the water I dipped from the side of the boat from the St. Johns River and tributaries, I call it excellent—in fact, as nice as rain water caught from the clouds, in a clean tin pan.

The dark color, which I mentioned before, Mr. Brown says is caused by tannic acid from the roots of various trees along the shore; but this in no way affects the taste, so far as I can discover. The St. Johns River in some places is more than five miles wide, and I should be quite happy indeed if I could always have as good water as this to drink when I am thirsty.

A FISH-STORY.

Of course, our picnic party fished on the way. Well, I am not going to tell just how many fish we caught; but friend Brown says there is a place on the Indian River where, if you go out in a boat and carry along some lights, the fish will jump into the boat in order to get to the light; and if you don't put out the lights when the boat is full they will actually jump in until the boat sinks. We have not been to that place yet; but as Mr. Brown is a very good man, we feel quite sure it must be true. Friend Blackmer was wicked enough to say that it seemed to him it was *considerable* of a "fish-story." I did see a fish with my own eyes that I thought must be an alligator, and a big one (a yard long or more, I mean); but the rest of the party assured me that it was a black bass, my favorite dish.

When we arrived at Daytona I thought very likely my wheel might be the only one in town; but as we prepared to get off the train I was agreeably surprised. Wheels for both ladies and gentlemen were everywhere, and I soon found out the secret of it—the beautiful shell roads and cement streets and sidewalks, besides the splendid wheeling either up or down along the beach. Many of our older readers are more or less acquainted with Dr. Jesse Oren, who lives in Laporte City, Ia., in summer, and Daytona in the winter. Dr. Oren met us at the train, and Constance and his daughter were soon old friends, to all appearances. Before we reached their beautiful home we were both quite captivated by the beauty of this place. Most of the inhabitants are well-to-do people from the North. The consequence is, the dwellings are all fine ones. The people are intelligent, and up to a high state of civilization. The beautiful roads are made from crushed oyster-shells, and these are obtained along the beach and near the river, heaped up in great mounds in many places, evidently left by a former race of people who piled up the shells after having used the contents for food. Among the shells are found fragments of pottery, which from their similarity have marked these places as the work of the mound-builders, found so generally over the United States.

Another way of paving the streets is from a kind of cement or marl, spoken of heretofore. This cement is found in various places, a mile or two out of town, occupying a foot or two just below the surface of the forests. The forest-trees are removed, the black woods dirt carted to town for gardens and lawns, and then the marl is taken out in huge blocks, pulverized, mixed with water and sand, then pounded down for pavements.

Here for the first time we see forests literally made up of palms and palmettoes. The sight of these beautiful straight trunks or smooth stems running away up fifty or sixty feet without a branch or limb, and then ending with a tuft on top, again and again makes me feel strangely, some way, as if I were in fairyland. Just imagine a dense forest made up of nothing but these trees, ranging from a palmetto just coming out of the ground, all the way up to a full-sized tree.

If you are out in the woods, and get hungry, and are so fortunate as to have an ax, you can chop out a good chunk of cabbage from any cabbage-palmetto at any season of the year, and you may eat your cabbage cooked or raw. The doctor says you would hardly know it from common cabbage, but you will have a lot of work to get it out. These beautiful trees are left all through the streets, dooryards, gardens, and back yards all over Daytona. The main street is 100 feet wide, left this width to preserve the beautiful native forests of palmettoes and live-oaks, draped with the moss I have described.

The adjoining pictures give you a glimpse of what we see about this beautiful place, the one showing the blossoms in the head of a cabbage palmetto; and great quantities of beautiful honey are gathered every year from this source. Dr. Oren has been spending his winters here for the last ten years. He is now engaged in putting up some beautiful cottages for rent to bee-keepers or others who may wish to stay over winter here. A pretty little cottage that he says was built at a cost of $500 has so much captivated my fancy that he has promised to have a picture of it taken to be given to the readers of GLEANINGS, at an early date. Such a cottage rents for $90 a season, the season to be a whole year or any part of the year, only you must pay the $90 if you have it during the season that Northerners usually come here. Bee-keepers will certainly do well to take in Daytona, and they shouldn't fail to call on Dr. Oren, for he can post them in regard to almost every thing they want to know. We find here these same artesian wells that are such a providence to all of Florida. By putting down a pipe only about 80 ft., enough water pours out for family use; and by going down still farther a much larger volume of water is obtained. Dr. Oren has just one such well for a group of cottages, and it furnishes something

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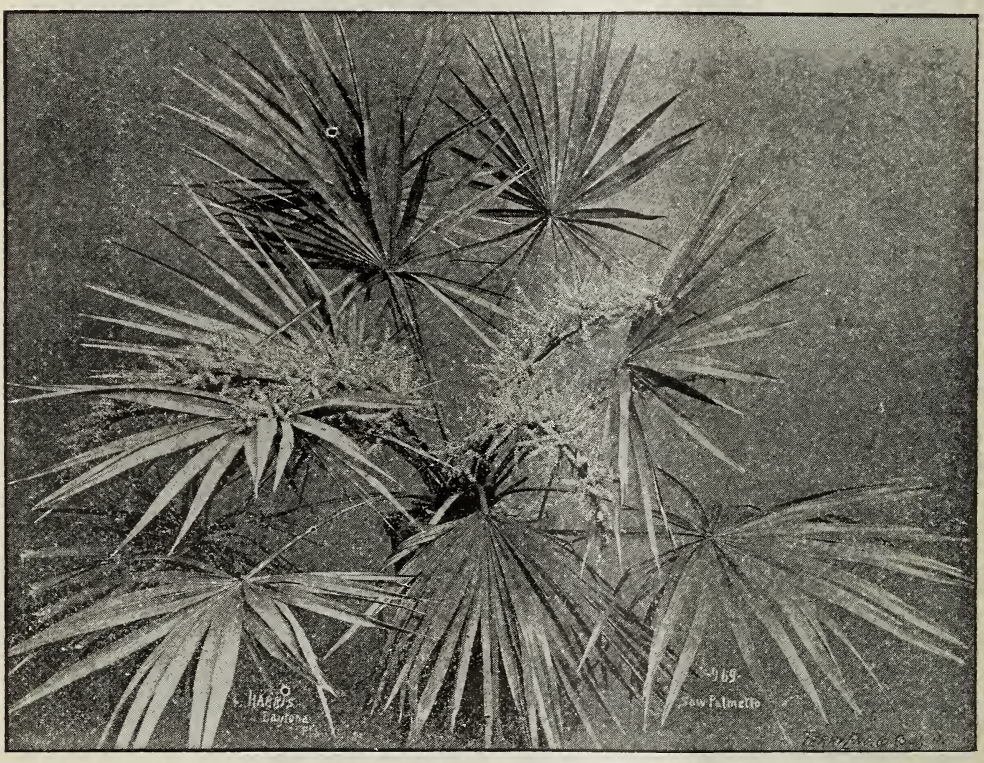
like half a dozen perpetual fountains, one close to the door of each dwelling. At one place on the main street a huge live-oak has a piece of wood driven into its body, after the fashion of a sap-spile in sugar-making. A good-sized stream of water runs from this spile, keeping a large tub constantly overflowing for the benefit of both man and beast. The doctor gives me a new fact in regard to these flowing wells. The sulphur taste and smell come from sulphureted hydrogen gas; but this gas is so volatile that it escapes, and is gone after the water has been for a little time exposed to the air. Everybody seems to agree that the whole of Florida is thus supplied with water. Where can all this immense volume under pressure come from? In crossing the long bridge this morning before breakfast, I found nice drinking-water pouring river, a great pipe, almost a foot in diameter, attached to a rotary pump, by a powerful suction sends shells, sand, and water over back of the sea-wall. The water runs away and leaves the sand and shells in shape to make a nice shell road close up to the wall. Trees are to be planted along this road, making one more beautiful shaded street in Daytona. This place, as well as other Florida towns, is supplied with beautiful ice made from distilled water. The proprietor of one of the ice-machines here showed us his apparatus and gave me the following description of its working:

THE MANUFACTURE OF ICE IN FLORIDA.

Common aqua ammonia of commerce is placed in a large upright iron tank. Through this tank is a coil of pipe through which steam



HEAD OF CABBAGE-PALMETTO.

forth as usual, but this time up through an iron pipe right out of the salt sea-water of the Halifax River; and I am told that, even out in the ocean several miles from shore, between this place and St. Augustine, is a fountain of pure fresh water, so large in volume that it rises a foot or two above the surface of the ocean, and makes the water pure and fresh for a distance so considerable that large vessels go here and pump up water for an ocean-voyage. Along the river the town is just now putting up a stone sea-wall; and to fill in back of this wall, and bring the town clear out to the water's edge, a steam-dredge is at work. This machine has a revolving metal frame, something of the dimensions of a huge barrel or hogshead. All around this barrel are knives, or cutters. As fast as it chops up the oyster and other shells covering the bottom of the passes until the aqua ammonia is made to boil. The vapor passes over into another similar tank, and the boiling is continued until the pressure reaches 100°. This liquefies the gas in the second tank Then a little stream of the liquid ammonia is permitted to pass through a coil of pipes running under the tanks of water to be frozen. The sudden release of this enormous pressure causes the gas to change immediately from liquid to gas again. When any gas-made liquid under pressure is relieved of said pressure so as to cause it to become gas once more, a large amount of heat is absorbed and taken up in a latent form. This heat is borrowed or abstracted from the nearest thing at hand, either solid or liquid. The consequence is a freezing temperature. The blocks of ice are put into a wagon, and delivered around town, or at the large hotels, just as fast as they are

made, and in order to avoid waste; and it is made only as fast as the public requires it.

Just one thing more, and we are done with the ice-machine. The ammonia is used over and over again, so as to avoid waste. After it has frozen the water by its sudden expansion it is conducted into a third iron tank, and warmed up by another coil of steam-pipes. Thus you see considerable steam is used in heating the ammonia in these various processes. After the steam has given out its heat, it condenses and becomes water; and this distilled water furnishes the material for making the beautiful, clear, pure lumps of ice. I begged for a taste of distilled water. A glass of it, not quite ice cold, was handed me. People may say what they please about their nice wells, cisterns, or springs; but there is nothing any better or nicer, after all, than *distilled water*, cooled by crystal sparkling ice made also of distilled water. It seems to me that any one who decides to use water in place of all other beverages is entitled to the very *best* water that the combined intelligence and science of the present day can make; and I do wish we could purchase for money a drink of distilled water in our large towns and cities, even if we can't in the country. You may say it is a small matter; but I do believe that our best physicans are awaking to the fact that a large part of disease is caused more or less by the water or other liquid which we drink; and *distilled* water is at the very top of every thing else. There can be nothing better.

This morning I saw a successful chicken-ranch. It was owned by a man whose house was built on one of the shell mounds. The chickens helped themselves to shell and artesian water, and the man fed them chit, from Indian corn thrown out where they manufacture hominy, and wheat. He gets on an average 100 eggs a year from each hen, and he sells the eggs for 35 cts. a dozen. His fowls are a cross between Light Brahmas and Minorcas.